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THIRD SERIES VOL 65 NUMBER 3 JANUARY 1958

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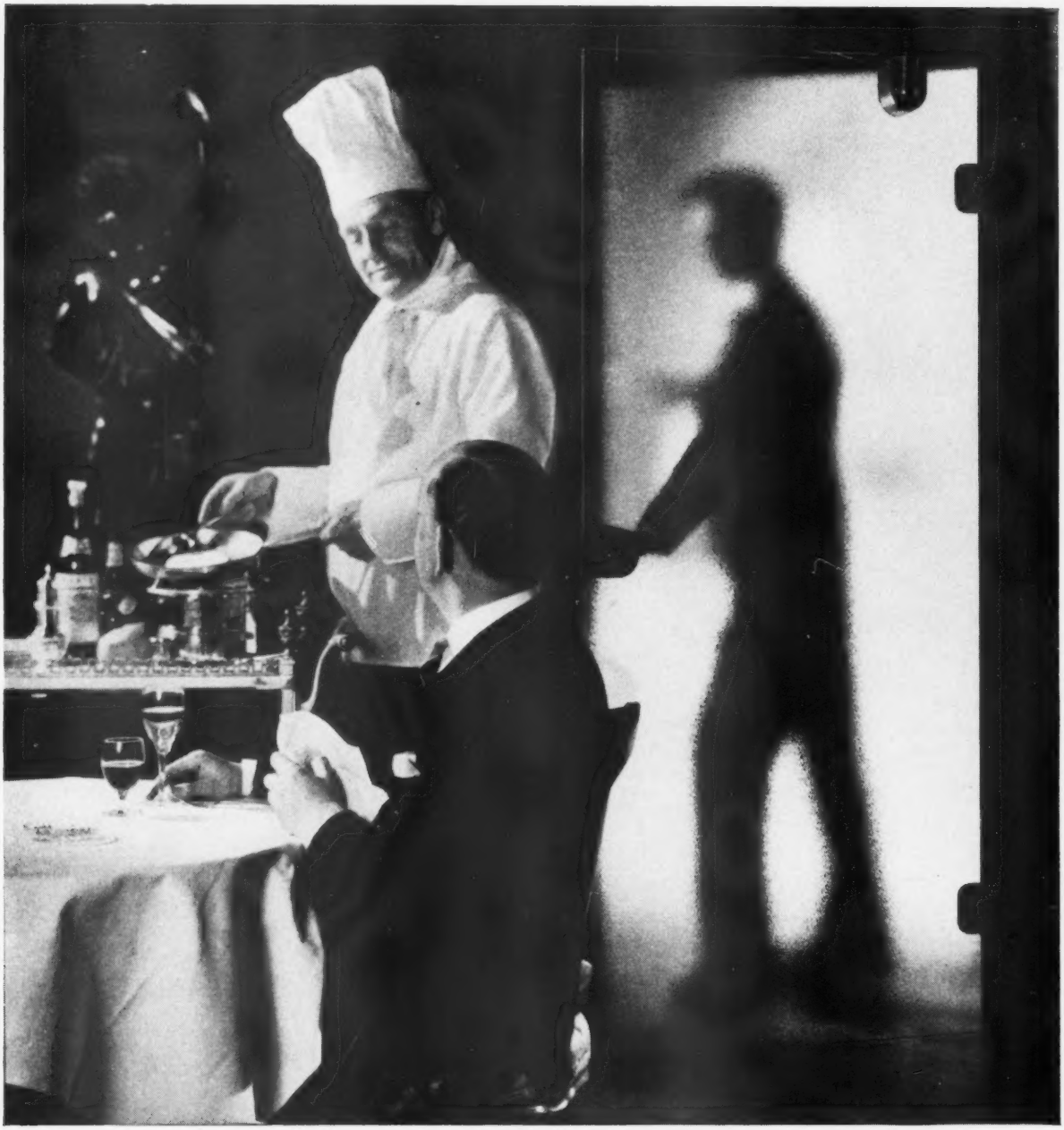

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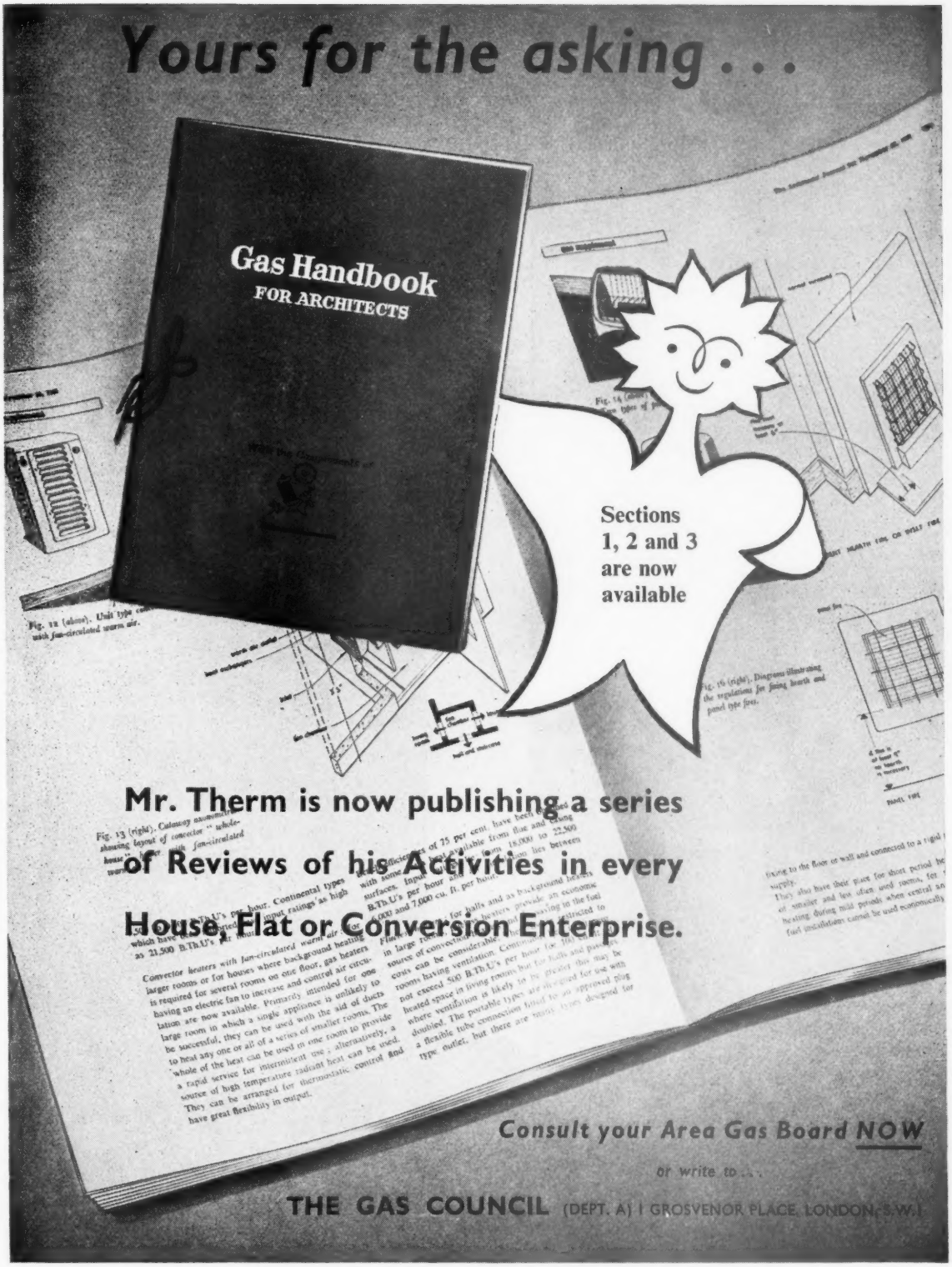

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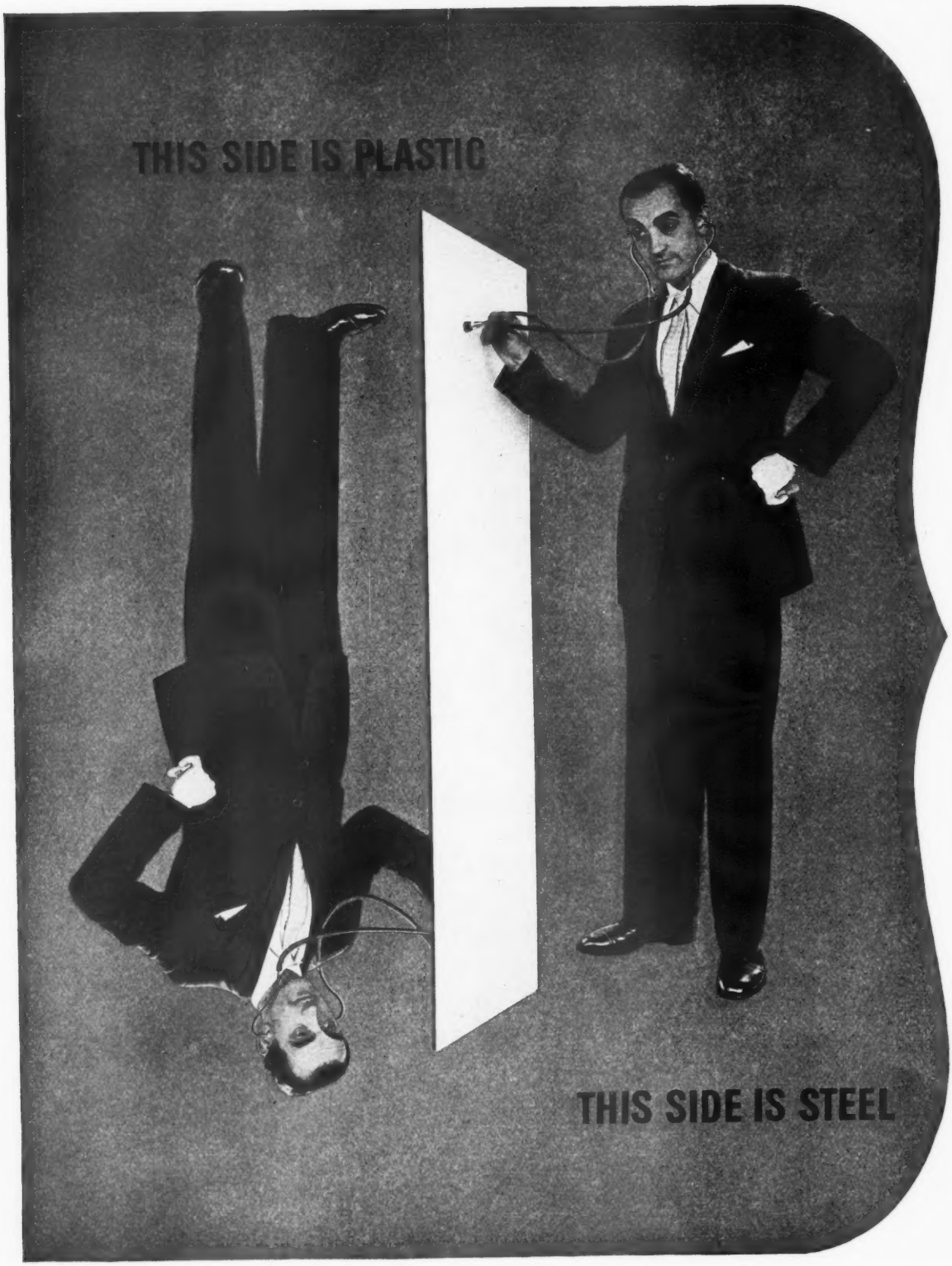
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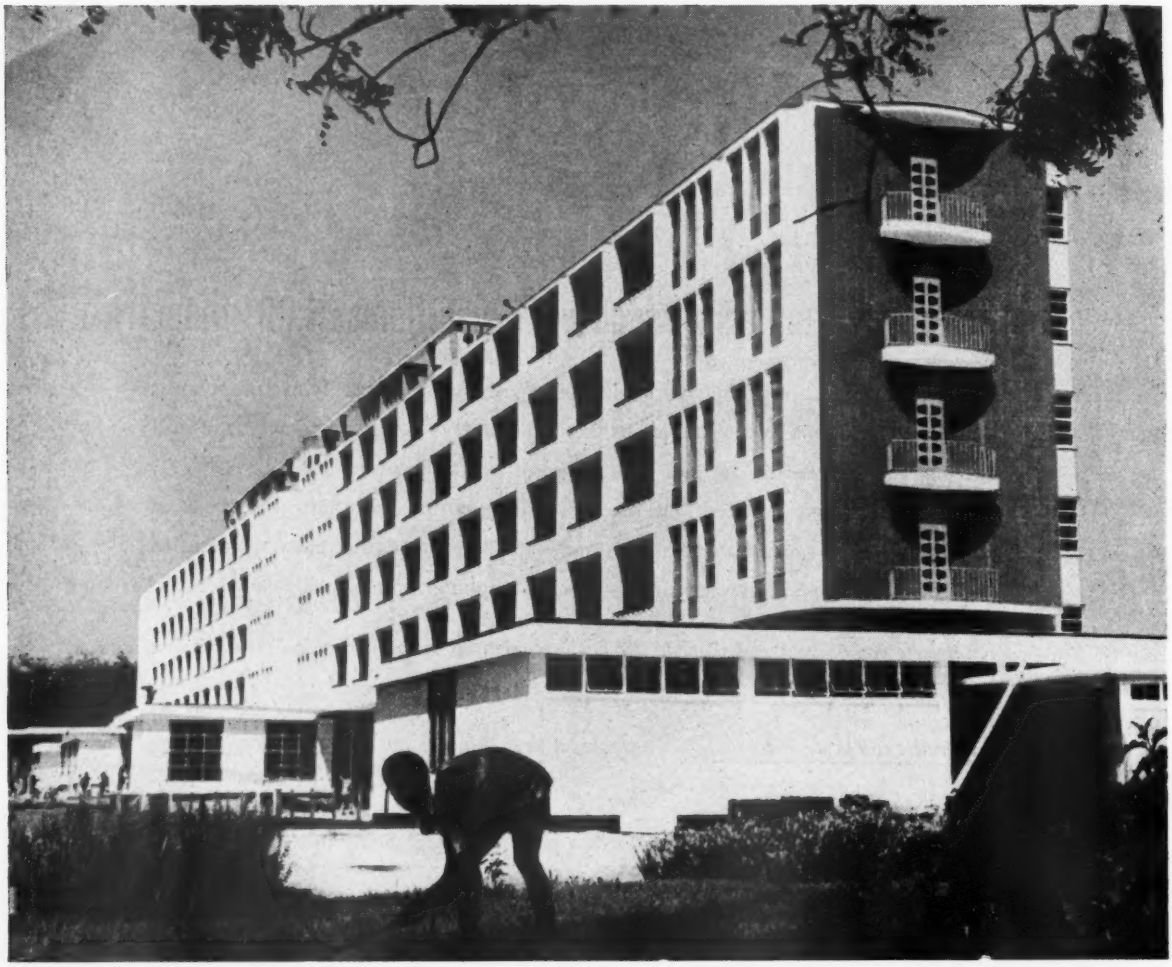

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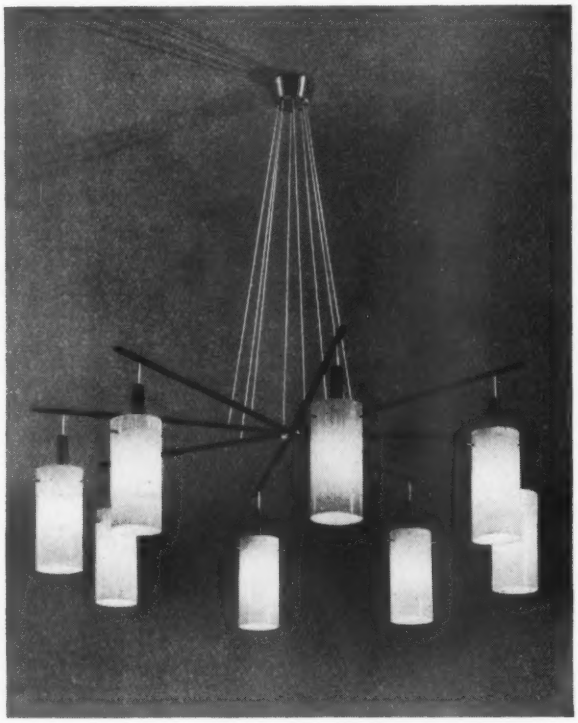

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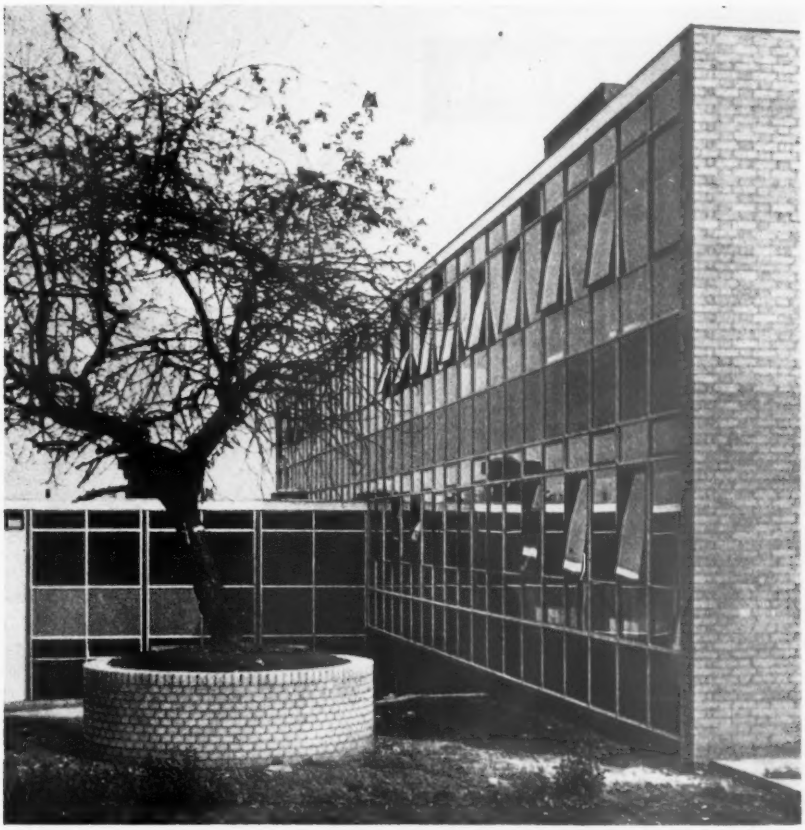

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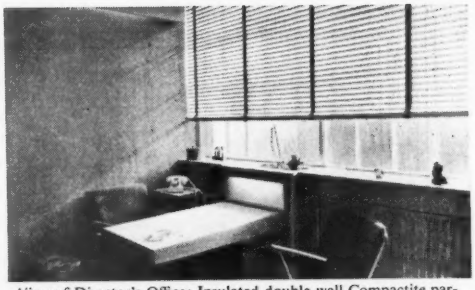
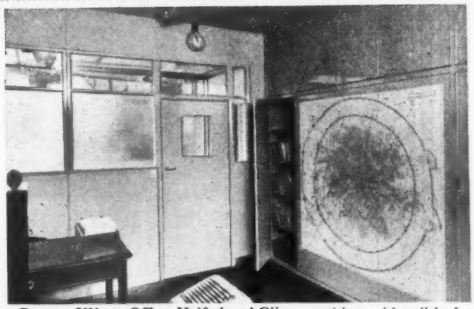
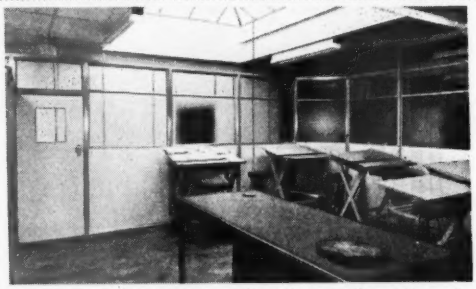


View of Director's Office: Insulated double-wall Compactite partitions faced with Etchwood; desk and fitments designed and constructed by Compactom.



Corner of Wages Office: Half-glazed Glinex partitions with polished timber framing and Compactom built-in cupboards.



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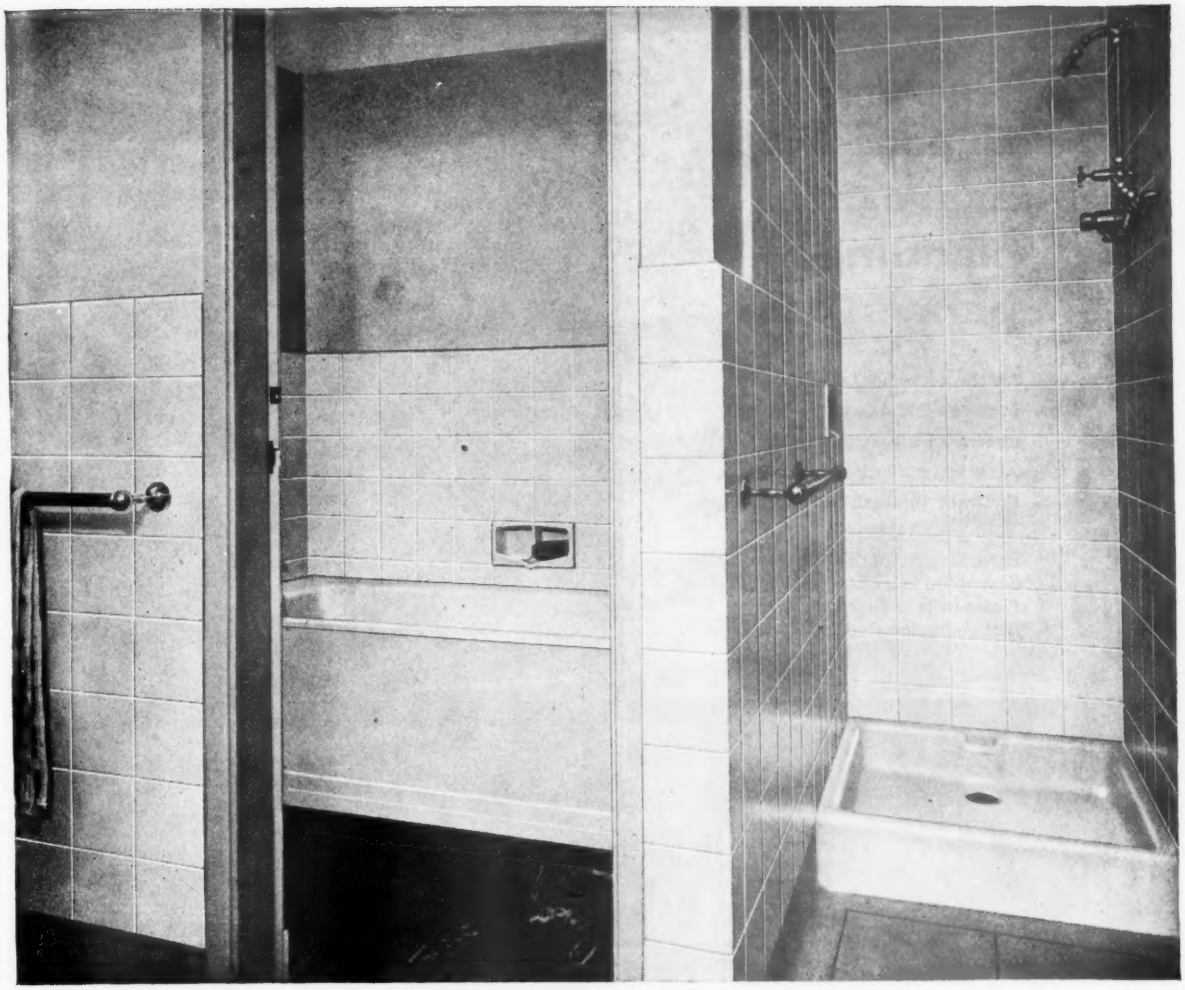

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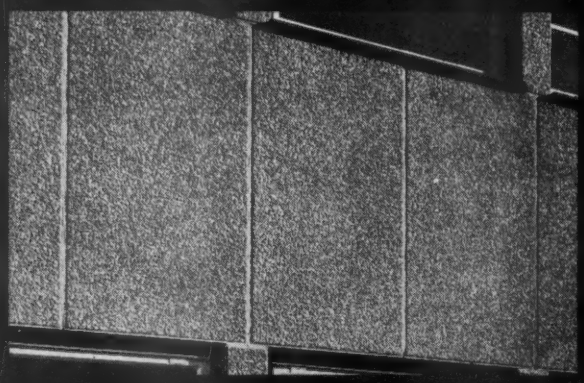

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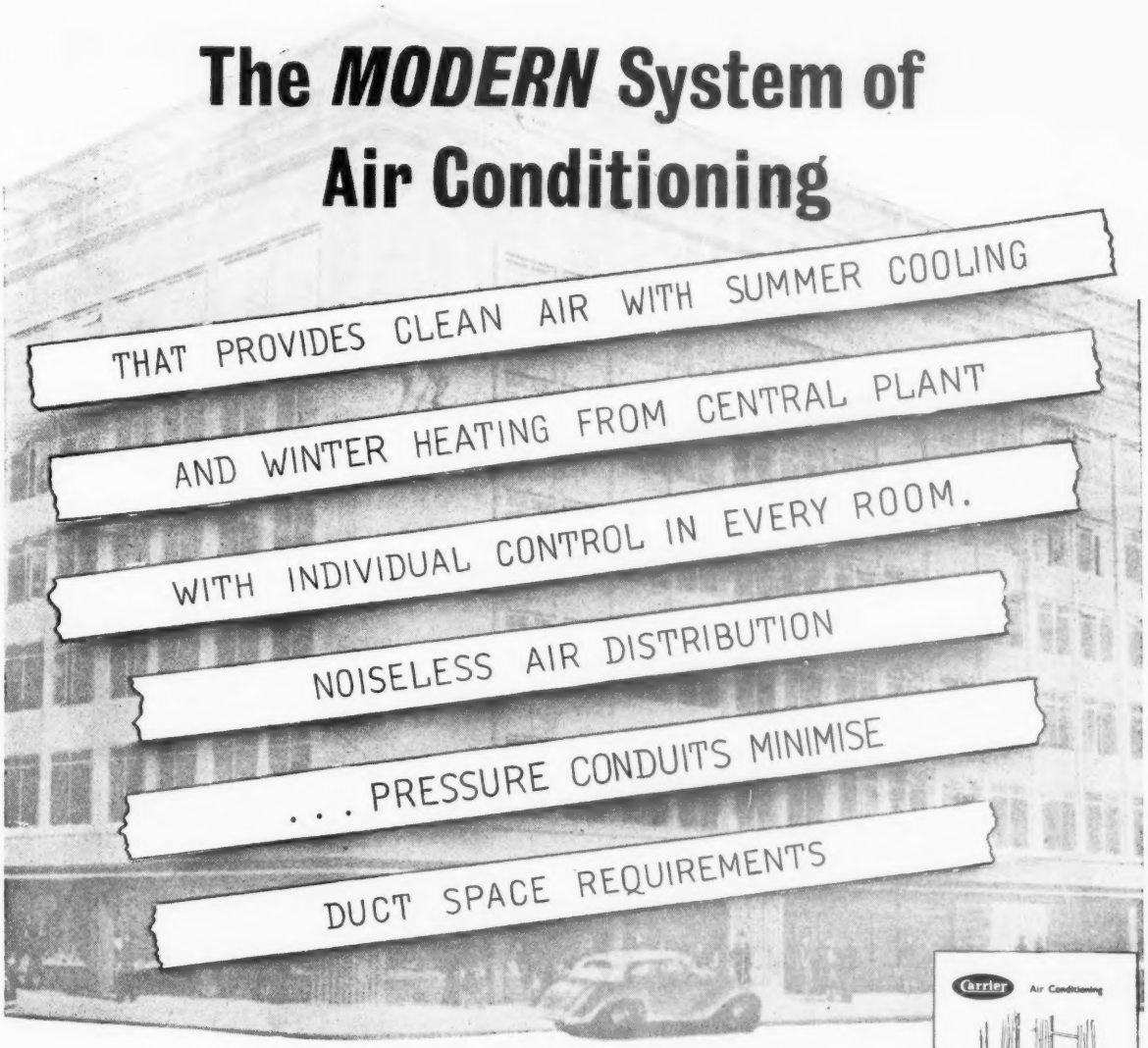
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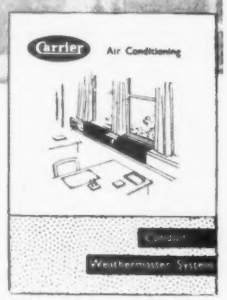

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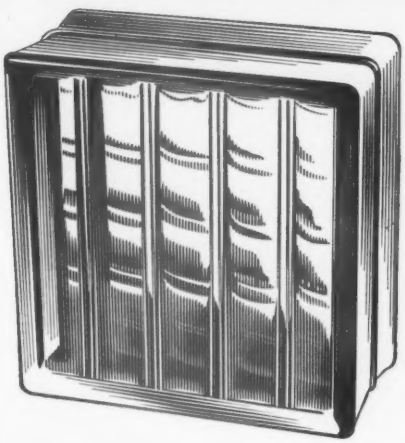

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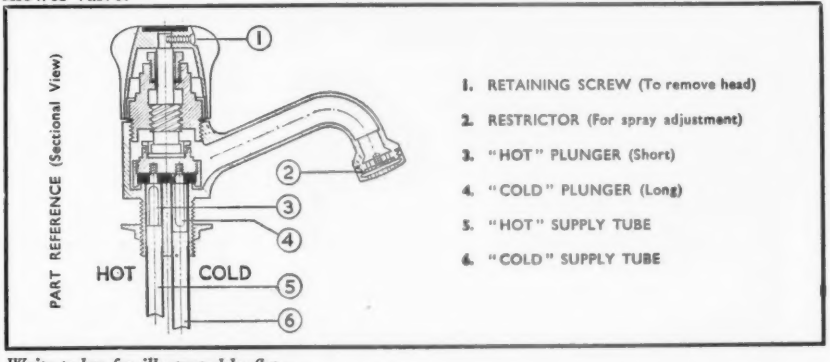

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AP58

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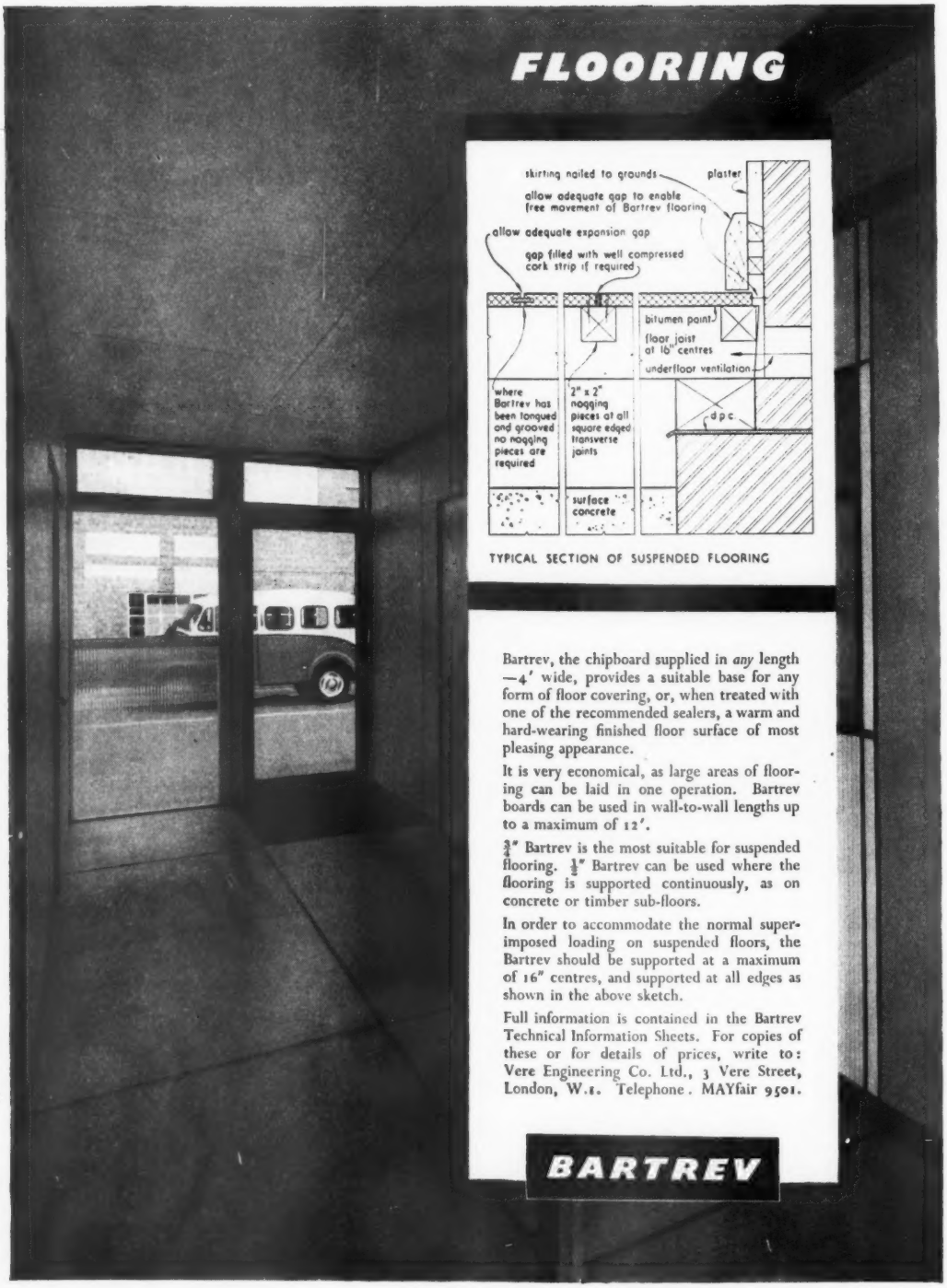

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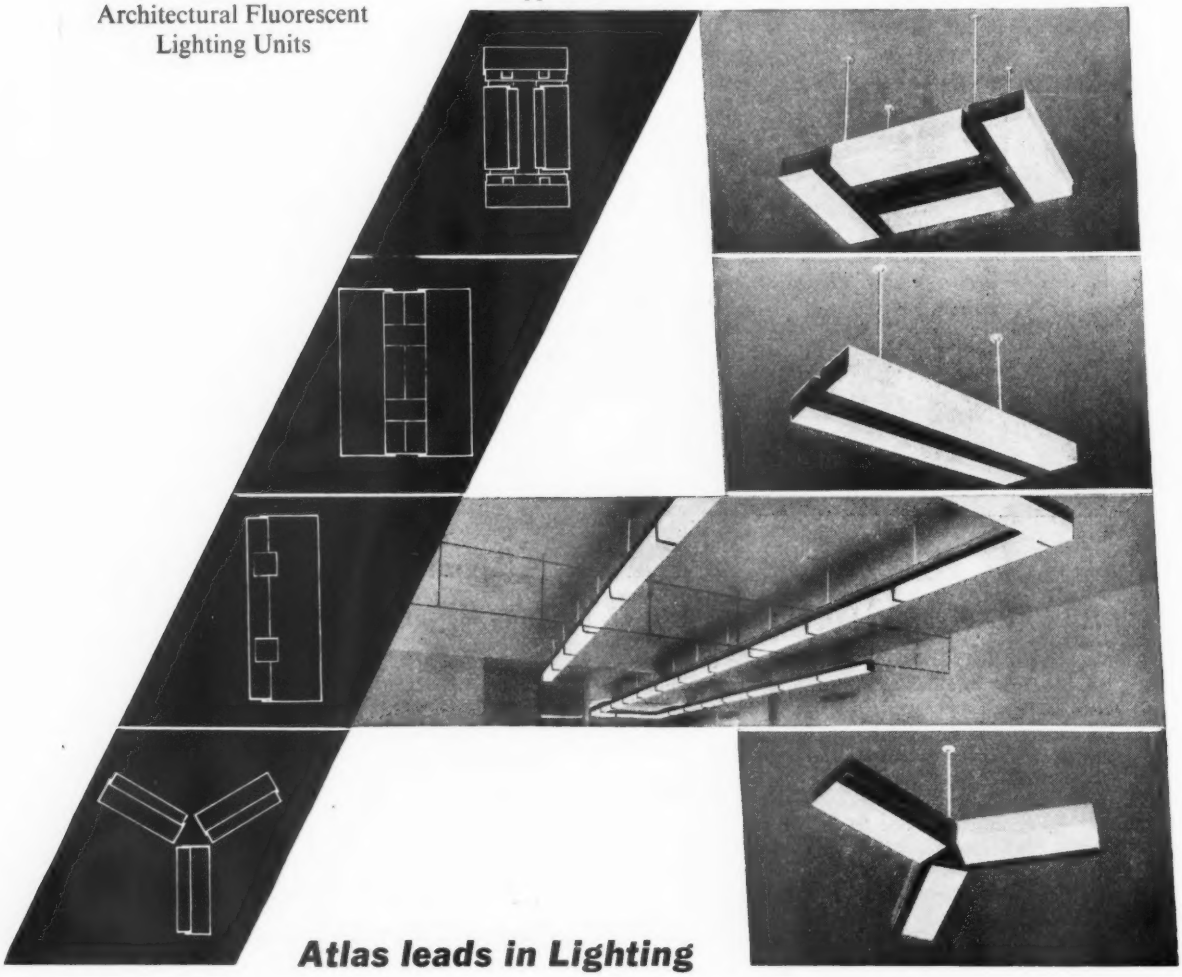

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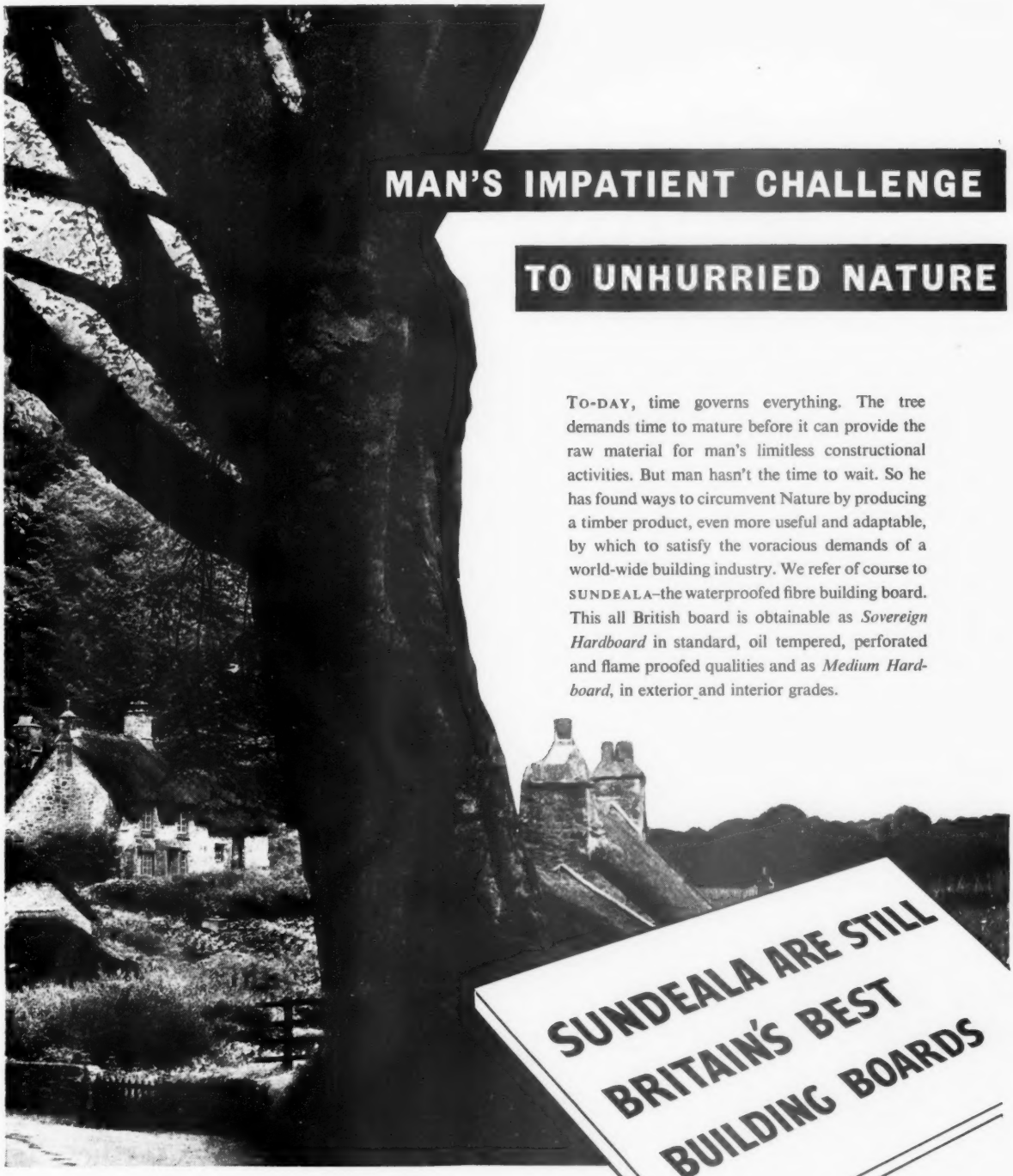

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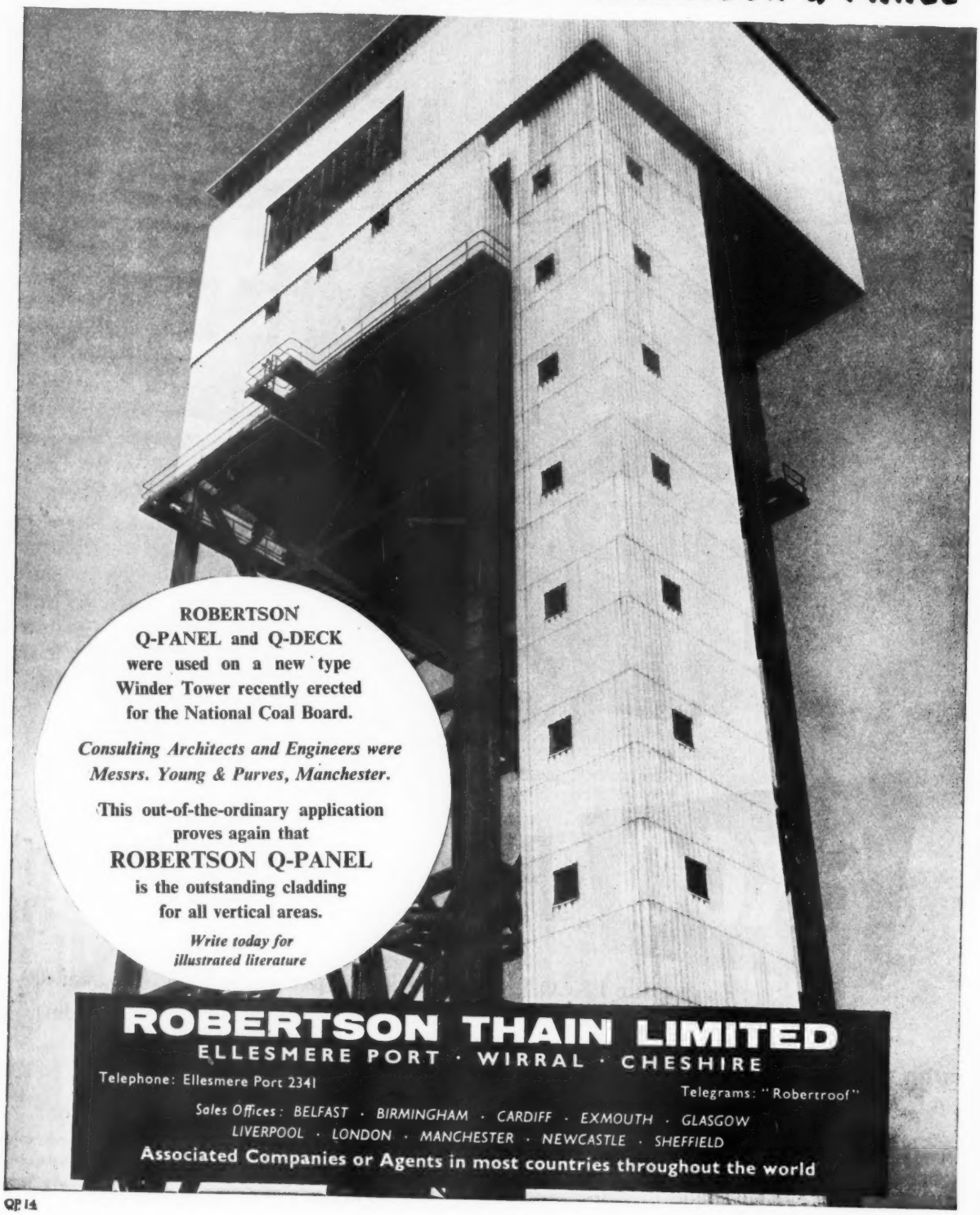
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QP 14

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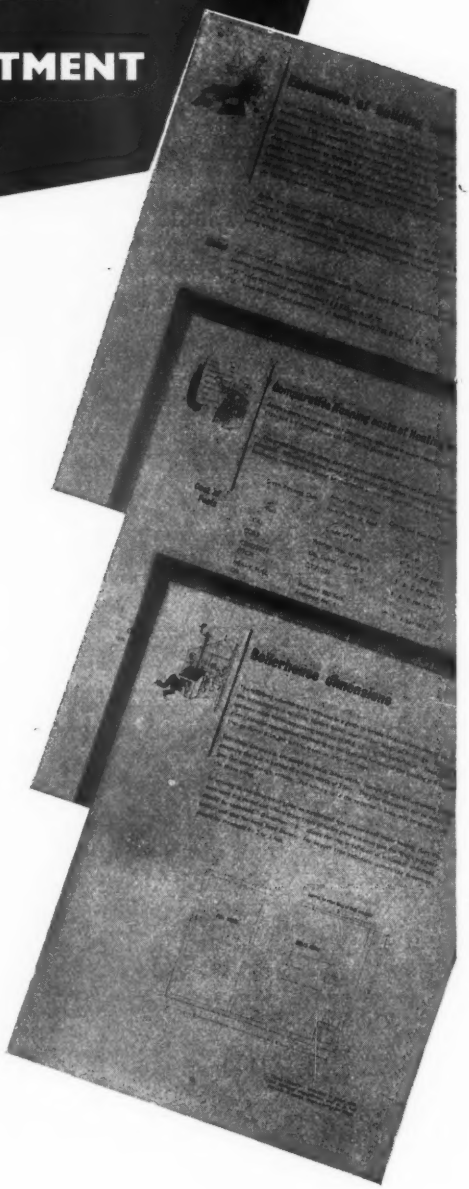

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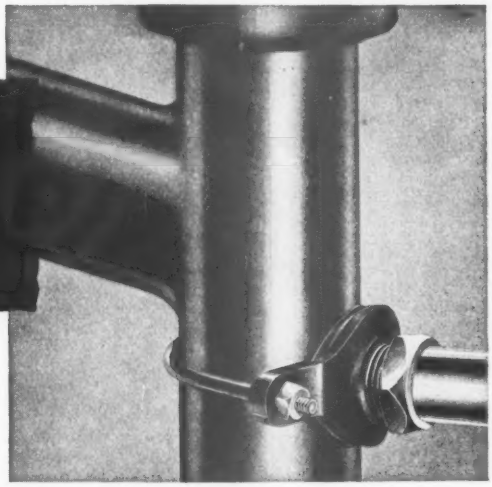

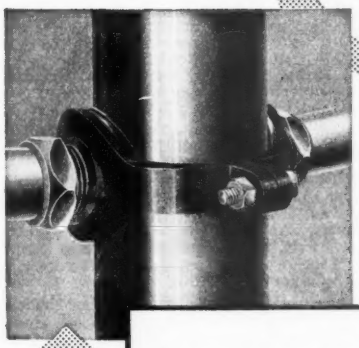

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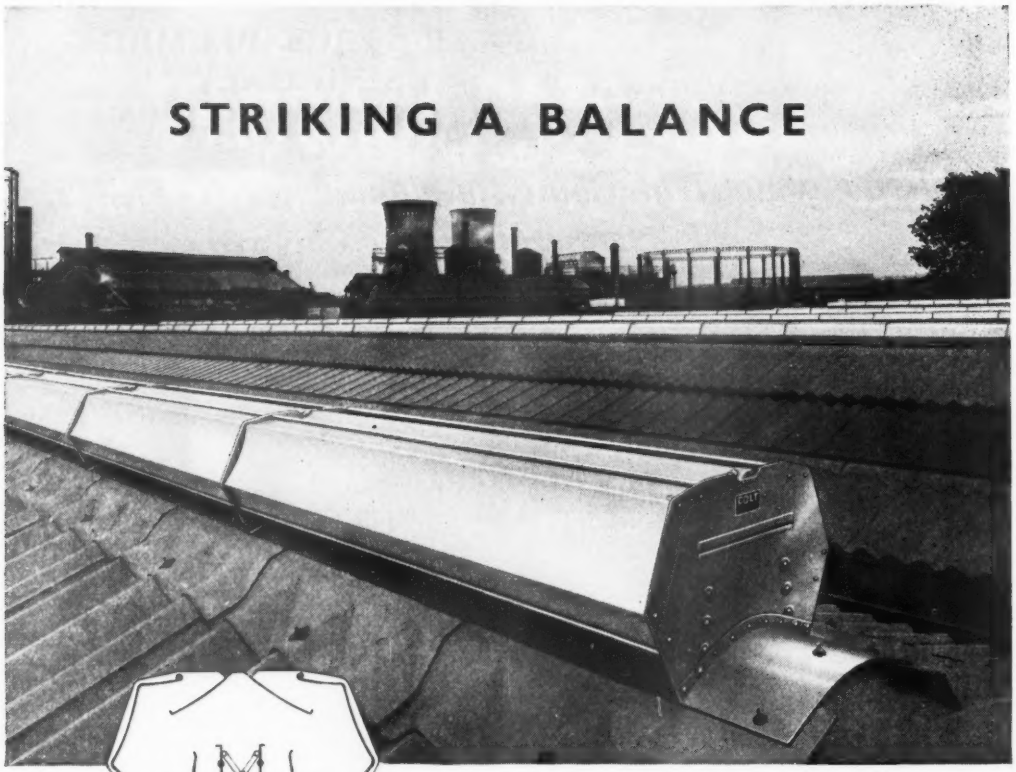

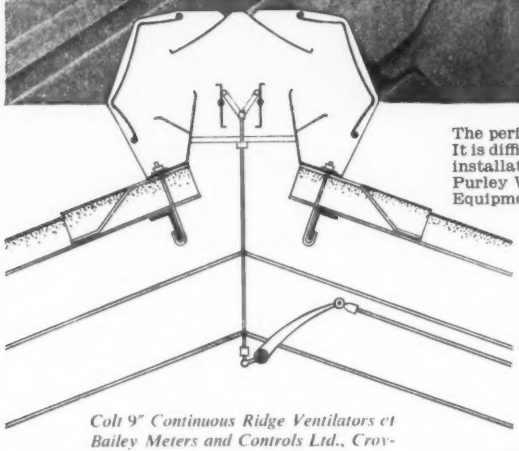

Colt 9" Continuous Ridge Ventilators at Bailey Meters and Controls Ltd., Croydon, Surrey. Architect: Reginald Lone, F.R.I.B.A., F.R.I.C.S., F.R.San.I.

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Architects: Messrs. Waterhouse & Ripley PP/F.R.I.B.A.
Interior Design (part): R. W. Lone F.R.I.B.A., F.R.I.C.S., M.R.S.I.

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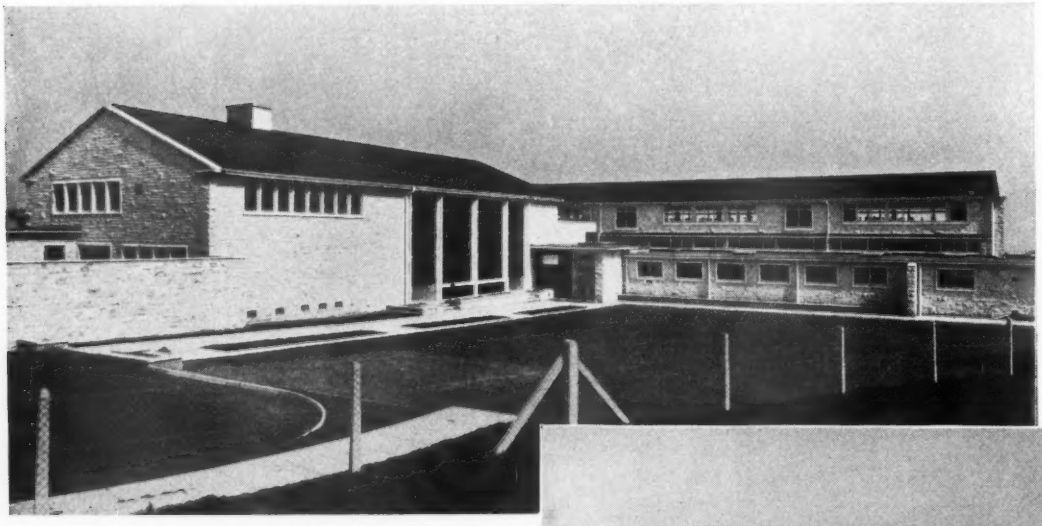

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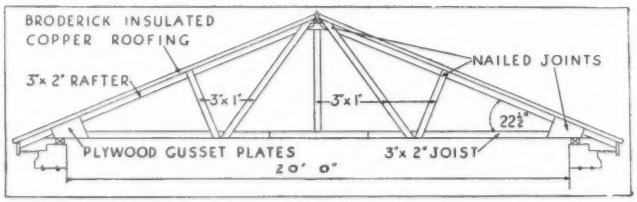

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JANUARY 1958 THIRD SERIES VOL. 65 NUMBER 3 THREE SHILLINGS AND SIXPENCE

EDITORIAL

Street Furniture

The architectural profession has for some time been very concerned about the low standard of design of street furniture in the British Isles.

The Town and Country Planning and Housing Committee of the Royal Institute have, therefore, studied the present conditions governing the provision of the equipment which today forms part of the familiar street scene and have prepared a report. The report concludes that as both the design and selection of sites are, in almost all cases, the responsibility of either a Government Department, Local or Highway Authority or a Statutory Undertaker, practically all street furniture is outside the scope of planning control, being either permitted under the General Development Order, 1950, or the Advertisement Regulations, 1948, or being development by a Government Department.

It is also acknowledged that although efforts are being made to secure improved designs of street furniture, especially by the Council of Industrial Design, many providing authorities still accept a poor standard of design and the use of incongruous materials. The report draws attention to the functions of the Royal Fine Art Commission, the Council of Industrial Design and the Ministry of Transport. It is considered that there should be executive consultation between the Highway and Planning Authorities. The Royal Fine Art Commission's opinion is quoted, that, 'it would be a great advantage if advice on the choice and siting of such equipment could be given by planning authorities, and if additions to the landscape and townscape that are made under delegated powers by such bodies as Urban and Rural District Councils, which employ no qualified architect, were to be made subject to such expert advice at an appropriate stage'.

The report recommends that the recently formed Civic Trust be asked to undertake a comprehensive survey of the problem and to publish an Advisory Manual giving guidance to those responsible for the provision and placing of street furniture.

There are many cases in localities where street furniture has been superseded by new, and where redundant furniture could be removed with advantage to the general scene. Allied Societies working with Local Authorities and Officials could do much to bring about an improvement in their own areas.

A photograph taken during the Queen's tour of the Building Exhibition last November. Her Majesty is listening while Dr. F. M. Lea explains an exhibit on the D.S.I.R. stand. With them are the Minister of Works, Mr. Hugh Molson, and the President, R.I.B.A., who accompanied the Queen.

The Building Centre

His Royal Highness The Duke of Edinburgh has graciously consented to become Patron of the Building Centre, which celebrated its 25th anniversary last year.

Prince Philip paid a visit to Store Street on 7 November and during the hour and a half he was there showed great interest and asked many questions.

Delegation of Powers to Local Authorities

The Committee on Bye-laws and Building Regulations have been considering various problems connected with the exercise by different authorities of delegated powers in connection with planning and Bye-law consents, etc. One or two instances have been reported in which two different authorities exercise delegated powers which are mutually contradictory in connection with the same application. The Committee would welcome examples of any similar anomalies which may have come to the notice of members, so that convincing examples can be quoted in any representations made for simplification of procedure.

Cumberland Terrace, which is to be converted by the Crown Estate Commissioners.

Cover Picture

Gloucester Gate (1827) is one of the Regent's Park Terraces which the Crown Estate is to offer for conversion by experienced developers into first class residential accommodation on a commercial basis.

Mr. Summerson in *Architecture in Britain* writes in his passage on Nash's bad detailing that when the executant architect of Gloucester Gate took it into his head to *double* the scale of the cornice mouldings with an effect that could still be noticed, Nash was content to observe that they had 'come out larger than he expected'.

A summary of the Statement by the Crown Estate Commissioners is given on page 96.

Mr. Frank Woodward

Having reached retiring age, Mr. Frank Woodward [*A*] relinquished his position on the JOURNAL of Technical Assistant Editor, at the end of last year. He has been responsible for the Review of Construction and Materials which he imbued with the humour and keen interest of his own personality. He will be greatly missed by his colleagues.

Mr. Woodward took up his duties as Secretary to the (then) Architectural Science Board and Technical Assistant Editor of the JOURNAL in 1946.

In 1951 the Architectural Science Board was dissolved by the Council and a Science Committee constituted in its place. Frank Woodward remained as Secretary to the new Committee until November 1952, after which he continued on a part-time basis writing the technical notes in the JOURNAL.

As previously announced Mr. Anthony Williams [*A*] is now Technical Editor.

Frank Woodward was elected an Associate in 1914. His brother, Mr. Charles Woodward [*A*], edits Practice Notes in the JOURNAL.

Index to Practice Notes

An index to Practice Notes published in the JOURNAL from January to December 1957 has now been prepared and copies may be obtained free of charge on application to the Secretary, R.I.B.A.

Council Business

A meeting of the Council was held on 10 December, with Mr. Kenneth M. B. Cross, President, in the Chair. It was reported that the exhibition of Danish Architecture (mentioned in the Notes from the Minutes of the Council Meeting in June 1957) proposed for 1958 will not, after all, be available. In its place the Council approved a proposal to show an exhibition of South African Architecture at the R.I.B.A.

The President said that he had made representations to the Minister of Works and the Chancellor of the Exchequer about the recent decision not to appoint an architect as Director-General of Works, Ministry of Works, as successor to Sir Charles Mole [*F*]. He had pointed out the necessity of having an architect in charge of the Department of State which was directly responsible for most of the Government's architectural work.

The Council fully approved the President's action.

Other notes from the Minutes are given on page 104.

Exhibition of South African Architecture

The Royal Institute is to present an exhibition of South African architecture in April. The exhibition is being prepared by the Faculty of Architecture of the Witwatersrand University under the supervision of the Dean of the Faculty, Professor J. Fassler [*A*]. It is being financed by the Department of External Affairs and will be brought to this country by the office of the High Commissioner for South Africa.

The exhibition aims to show the best work from all over the Union and has the backing of the Institute of South African Architects and the various provincial institutes.

This exhibition follows the showing of an exhibition of Australian architecture which was presented at the R.I.B.A. two years ago and will take the place of the proposed Danish architectural exhibition which has unfortunately had to be cancelled.

The Deputy Director-General of Works, Ministry of Works

The editorial note last month referring to the retirement of Sir Charles Mole [*F*], Director-General of Works, Ministry of Works, at the end of February, omitted to give the name of his Deputy, who is, of course, Mr. C. G. Mant, C.B.E. [*F*].

While Sir Charles Mole's post remains vacant Mr. Mant will assist Mr. A. J. Filer, C.B., in his duties as non-professional General Manager responsible for the general organisation, co-ordination and direction of the work of the Directorate-General.

Architecture Club

A supper of the Architecture Club was held at Simpson's in the Strand on Thursday 28 November, under the Chairmanship of the President, Viscount Esher [*Hon. F*], and was followed by an illustrated debate on the proposition 'That America is leading Architecture astray'.

The debate was opened by Mr. E. Maxwell Fry, C.B.E. [*F*], and Mr. Richard Sheppard [*F*], and was continued by Mr. McCallum, Mr. Goulden, Mr. Cadbury-Brown, Mr. Shepheard, Sir Howard Robertson, Mr. Brett, Mr. Edmonds, Mr. Smithson and Mr. Pattrick.

Unveiling of Plaque to W. R. Lethaby

On 27 November, the Chairman of the London County Council, Mr. R. McKinnon Wood, O.B.E., unveiled a plaque on the Southampton Row façade of the Central School of Arts and Crafts commemorating the centenary of the birth of William Richard Lethaby, the School's first principal. This ceremony was followed by the opening by the President of the Royal Academy, Mr. Charles Wheeler, C.B.E., of a small exhibition of Lethaby's drawings and furniture including a number of water-colours and drawings lent by the R.I.B.A.

The P.R.A., who had been a pupil of Lethaby's at the Royal College of Art, said in his speech that Lethaby's teachings were always wise and sound, and that his influence was still felt, and increasingly so.

He described Lethaby as he knew him and remarked incidentally how he would have hated the leaving of cars parked untidily in the streets as they are today. What was needed, Mr. Wheeler said, was the spirit of Lethaby to come back to London.

The Sir Banister Fletcher Prize

The Authors' Club held a House Dinner on 27 November to present to Mr. H. M. Colvin [*Hon. A*] an award for the authorship of the most deserving book on architecture published in this country during the two-year period ending 30 June 1956.

The presentation was made by Professor Sir William Holford [*F*], who selected the book *Biographical Dictionary of English Architects (1660–1840)* on behalf of the Authors' Club.

The occasion resulted from a bequest to the Club by the late Sir Banister Fletcher who was for many years the Club's President. Income from the bequest provides an annual sum to be awarded to the author of a selected book on the fine arts.

Public Parking Garages

A limited number of copies of the text of the science lecture to be given by Sir Herbert Manzoni at the R.I.B.A. on 21 January will be available in advance to members intending to be present at the meeting.

Applications should be addressed to the Secretary, R.I.B.A.

A.B.S. Ball

It was generally agreed that the A.B.S. Ball was better than ever this year. The Greek theme of the Ball proved a great inspiration in the design of the décor and the production of the menu.

It is understood, as the JOURNAL goes to press, that profits will exceed £3,000, which will help towards the building of the Old People's Homes.

Library Bulletin

Members are reminded that they can obtain the Library Bulletin free on application to the Librarian. In it are reprinted, in classified order, the more important references which are added to the Library's index of periodicals; it also lists the books newly acquired by the Library. It is thus a record both of current architecture and of architectural literature.

The Bulletin is published quarterly.

A general view of *Portrait of a Town* exhibition which was shown at the R.I.B.A. 13–23 December. It was prepared by the Guildford School of Art.

York Courses in 1958

This year's programme of courses, organised by the York Institute of Architectural Study, includes two important post-graduate courses, one on *Landscape Reclamation* (17–22 April) and the other on *Problems of Mining Subsidence* (15–19 September). The former is intended primarily for town planners and landscape architects and will deal with many of the problems of the reclamation of derelict and waste land, spoil heaps, etc. The latter is designed for practising architects, surveyors and builders.

As this year will mark the 10th anniversary of the first York Summer School for Architectural Students an interesting programme of lectures is being arranged and will be held from 26 July to 9 August. *A History of Railway Architecture* (23–30 August) has been added to the list of summer schools, which also includes *A History of English Architecture* (9–16 August) and *The English Country House* (16–23 August).

In addition to the practical course on *Landscape Design* (26 July–16 August) a similar course on *Architectural Design* (26 July–23 August) has been added to meet the needs of students who are working in offices and studying part-time for the R.I.B.A. examinations.

There will be a general course on *Protection and Repair of Historic Buildings* (20–29 March) and a more specialised course on *The Care of Churches* (29 March–3 April).

In the autumn there is a course on *Modern Techniques in Timber Construction* (11–15 September) and a repeat (19–23 September) of the course on *Architectural Project Management* which finished this week. Inquiries should be addressed to the Secretary, Mr. J. P. West-Taylor, York Institute of Architectural Study, Micklegate, York.

R.I.B.A. Diary

MONDAY 13 JANUARY, 6 p.m. Library Group. Talk on Regency Singapore, 1819–36, by Mr. T. H. H. Hancock [*F*].

TUESDAY 21 JANUARY, 6 p.m. Science Lecture. *Public Parking Garages*, by Sir Herbert Manzoni, C.B.E., M.I.C.E.

TUESDAY 4 FEBRUARY, 6 p.m. General Meeting. Mr. Basil Spence, O.B.E., A.R.A.,, A.R.S.A., Hon. Secretary, will present the film on Coventry Cathedral. Criticism by Mr. Peter F. Shepheard, A.M.T.P.I., F.I.L.A. [*A*], of work submitted for Prizes and Studentships. Presentation of Prizes by the President, Mr. Kenneth M. B. Cross, M.A.

Architectural and Building Requirements as related to Atomic Energy

By Sir John Cockcroft, O.M., K.C.B., C.B.E., F.R.S., Ph.D., D.Sc.

Given at the R.I.B.A. on 10 December

The President, Mr. Kenneth Cross, in the Chair

SINCE 1946 a great deal of building work for atomic energy has been carried out, the cost of which has amounted to some £15 million for Harwell alone. It began by the conversion of the Harwell airfield of the R.A.F. to a research establishment and the conversion of the Springfields and Sellafield munition factories to produce uranium and plutonium. Since then a giant diffusion plant has been built *de novo* at Capenhurst and research and development establishments have been built at Aldermaston and Dounreay in the north of Scotland. The early part of this work was carried out by the architects and engineers of the Ministry of Works under the direction of Sir Charles Mole to whose indomitable energy and vision we are all indebted.

Building for atomic energy purposes differs from conventional building only in having to provide for protection against radioactivity whether from atomic piles or from radioactive materials in laboratories or radioactive wastes going to effluent systems or storage. Superimposed on this we had the unusual problem at Harwell of converting its 175 buildings to laboratories, workshops and other facilities. Not a single one of the R.A.F. buildings has gone unused, even the underground petrol storage dumps have been used. As a corollary to this we have built annexes on to the existing buildings and hangars and in doing so have seen the progression of styles from Neo-Georgian brickwork to panelled prefabricated constructions with at least one example of South Bank style in the Harwell Lecture Theatre—which has turned out to be exceedingly good both for lectures and concerts and film shows. During the course of a year no less than 400 lectures and functions are held there. I would commend it for its simplicity, style, acoustics, comfort and price to other organisations thinking of building a lecture hall for 250–300. It has also proved to be of great value in receiving distinguished visitors, for its ground floor conference room is well suited for this. We have received there Her Majesty the Queen, successive prime ministers and innumerable foreign guests.

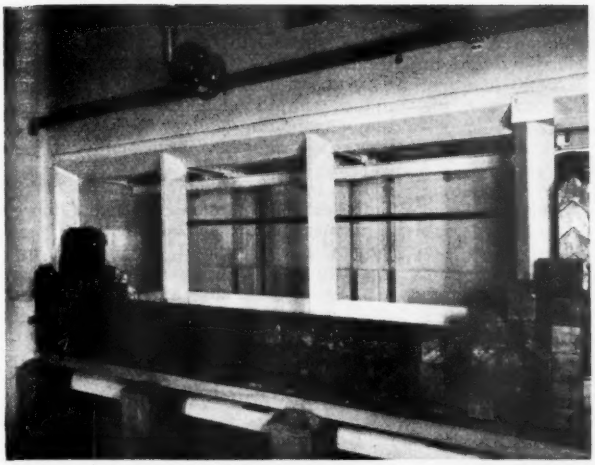
In our office buildings we have evolved towards the use of module of between 10–12 ft., suitable for a single office for juniors and providing, with two modules, adequate offices for the most senior. Offices are distinctive only by their being furnished with a blackboard convenient for office conferences, mathematics abstruse or simple, reminders of jobs and interviewing to be done. We are all blackboard-minded. Architecturally there has been a tendency to use a greater and greater area of glass and with that has come the use of venetian blinds to prevent too much solar heating on those days when the sun does shine. The next slides show recent office blocks at Harwell, Risley, and a proposed office block for Winfrith Heath. [Not illustrated.]

One of the most important new buildings at Harwell has been the radio chemical laboratory. Its design was dominated by the fact that the chemists there work with radioactive solutions. Some of these emit penetrating gamma rays—so the chemists have to be shielded from them by lead walls, built up from prefabricated interlocking bricks. Other materials emit high-speed electrons or particles. These are easily stopped by a small thickness of material, but another hazard has to be guarded against. For chemists on occasions *do* spill the solutions and so the radioactivity appears in the form of dust and can get into lungs. Some of these materials are so highly toxic that a person can only take into his system less than one millionth of a gram of radium during his working life, so the laboratory has to be designed to cope with this hazard. Also the ventilation of the laboratory has to be extremely good and up to 200 air changes an hour are provided for. In addition to this all fume hoods have an inward air-flow of up to 150 ft. per minute. To provide for this ventilation the upper floor of the laboratory is devoted mainly to ventilating ducts for incoming plenum air and outgoing air. There are, of course, other services carried in the same upper storey. The incoming air has to be heated and filtered and the outgoing air passes through electro-static precipitators and filters to take out any radioactive particles sucked out of the laboratory.

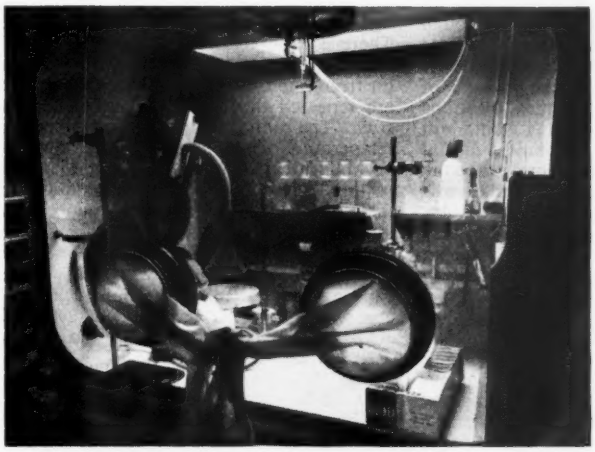
The building is arranged in two working wings, one for materials such as plutonium which emits particles and the other mate-

The Theoretical Physics Division annexe to hangar, Harwell.

Cockcroft Hall, the lecture theatre of the Atomic Energy Research Establishment.

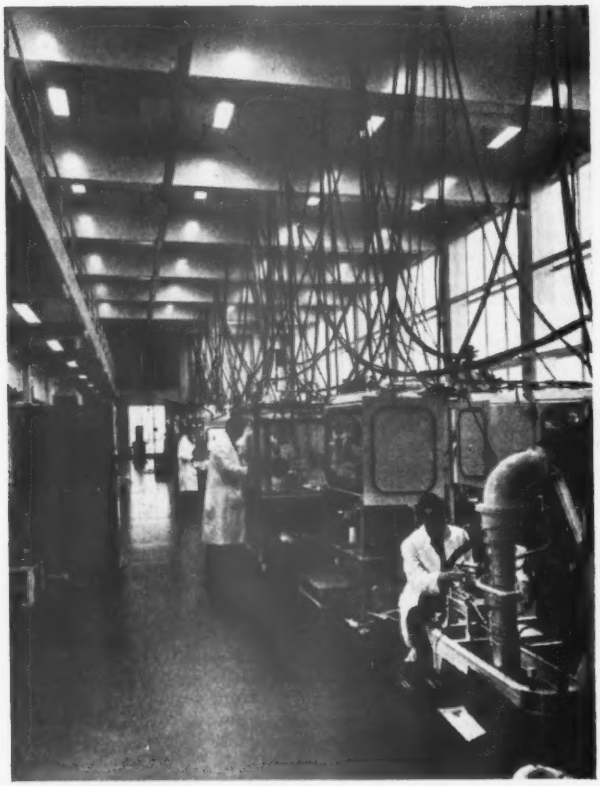


Lead walls being built up in front of fume cupboard in the Radio-Chemistry building, Harwell.



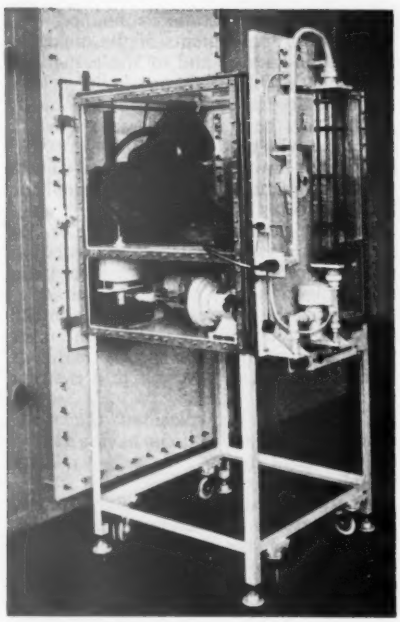
A glove-box for handling plutonium. The box is totally enclosed, the inside being maintained at sub-atmospheric pressure so that all air-leaks are inwards. Handling of all materials is carried out with double P.V.C. gloves.

Left: The mildly radioactive liquid effluents drain into delay or 'hold-up' tanks situated in the courtyard of the Radio-Chemistry building.



A view of the Plutonium Handling wing of the Radio-Chemistry building, Harwell. The wing is notable for its use of so-called glove-boxes shown in the close-up on the left.

Right: A glove-box being cleaned by a frogman.



rials which emit electrons and gamma rays. Connecting the two wings is a service building with offices, conference rooms and change rooms through which workers pass to and from the active buildings. The corridors are equipped with monitors so that outgoing workers can check that the radioactivity on their hands and clothing is below the tolerance level.

The equipment in the most recent plutonium-handling wing is notable for its use of so-called glove-boxes in which all operations are carried out inside closed boxes by gloves so that hands are shielded from the radioactivity. These glove-boxes become highly contaminated with activity in the course of time. They can be decontaminated by wheeling them to the face of a decontamination room where frogmen can clean them, protected by their ventilated suiting.

The building has numerous fixed groups of services—water, electricity, gas, air, vacuums, which can be connected to any store room.

The mildly radioactive liquid effluents from this building drain into delay or 'hold-up' tanks situated in the courtyard. The drainage pipes used are fabricated from polythene or stainless steel and are carried in covered, bitumen-lined, concrete ducts. This facilitates inspection and repair of the pipes and prevents any leakage from contaminating the surrounding ground. Polythene and stainless steel have been chosen partly because of their good general chemical resistance and partly because they can be decontaminated easily.

The delay tanks used are of two types: mild steel hard rubber-lined for the more active liquors and concrete-lined internally with a rubber latex cement coated with trowelled neoprene—for the very low activity effluents. All tanks are contained in concrete 'saucers' which are bitumen-lined sufficiently to give a protective capacity equal to the tanks contained.

When full the contents of the tanks are sampled and tested and, if the activity of the effluent is below a figure which has been set for that particular tank, the liquid is pumped to the main active drain which serves the whole of the establishment. The liquid then flows by gravity to the effluent treatment plant where the daily effluent from all delay tanks is batched, treated and finally discharged to the Thames. We are allowed a certain ration of radioactivity which we can discharge each month. If the activity level of the effluent in the delay tank is higher than expected the contents are transferred to a tank waggon and taken to the effluent plant for special treatment. If the radioactivity is very high it is stored until it decays.

This system is typical of the whole establishment—any building having a radioactive effluent has its own delay tank and sampling systems.

Another unusual building is the recently built annexe to the metallurgy laboratory. This building has been erected for the examination of metallurgical specimens which have been irradiated in research reactors and which have activities of up to 10 curies. In this case the simplest and cheapest type of building was used. Inside it were erected cells shielded by lead or concrete blocks with remote handling equipment to view and photograph the specimens. Since the radioactivity is associated with solids and not liquids there is no need for a special ventilation system.

The active chemical engineering building is another example of a highly ventilated building since the chemical engineers work with radioactivity in solutions. They also needed height to provide for the long columns which are often used to separate the different components of radioactive liquids such as plutonium from fission products or uranium 233 from thorium. The columns are boxed in with plastic walls and shielded where necessary.

The most recent example of buildings to house reactors are the buildings for the DIDO and PLUTO reactors. We decided to house these reactors in air-tight steel buildings to act as a second line of defence against any possible escape of radioactive products from the reactors. The next slides show the steel shell and the entry through an air lock. These buildings have a leakage rate of 0·05 per cent per day. The steel shell will withstand an excess pressure of 6·5 lb. per sq. in. If any chemical reactions raised the pressure the building would still stand up. A circular crane is an unusual feature of the interior. Annexes to the circular building provide offices and experimental laboratories. The two reactors are situated well below the level of the Ridgeway so to some extent they are shielded from general view. We once asked Mr. John Betjeman what he thought of the ensemble viewed from outside and received a not unfavourable reply.

A very unusual building now being constructed is the reinforced concrete building to house a giant proton synchrotron of the National Institute for Nuclear Sciences. The proton synchrotron is a magnetic racetrack for nuclear particles 150 ft. in diameter consisting of 6,000 tons of magnetic blocks. The racetrack has to sit on a surface which must depart from a plane by less than 1 mm. So a circular building 200 ft. in diameter has been designed capable of taking this heavy load and of retaining great stability. The next slides show the outline of the design. When completed the building will be covered with 10 ft. of earth to provide protection against the seven billion volt particles which will be generated. A large amount of space has also to be provided for the experimenters who will use powerful magnets to guide the particles to their experimental apparatus. At the same time shielding blocks have to be provided to protect the experimenter. You will see a heavy reinforced concrete structure and on top of that we shall pile back the earth excavated for the foundations of the building.

The development of the Harwell site had to face the difficult problem of merging the existing buildings of the airfield with new buildings into a single layout, itself placed in the heart of the open country below the ridge of the Berkshire Downs. On the advice of Sir Charles Mole an open layout was adopted with spacious lawns between the new buildings and the parks and gardens department have played a large part in the attempt to blend the Harwell site into the surrounding country. Thousands of trees and shrubs have been planted as well as lawns and flowers.

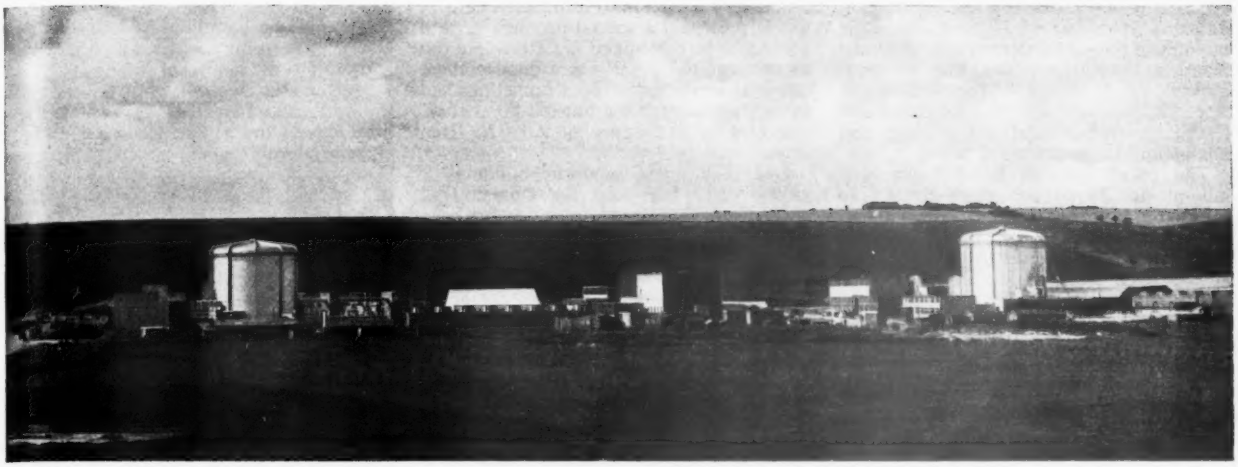
The building design problems of the Industrial Group of the Atomic Energy Authority have been different in scale though not in kind. The Design and Construction Group is now led by Mr. Viney who would be much more competent to describe the work than I am, so naturally I have received help from him.

One of the largest building projects of the Authority houses the gaseous diffusion plant at Capenhurst. The diffusion plant is used to increase the concentration of the light uranium 235 in uranium. It consists of a large number of units each of which increases the U 235 concentration slightly. Uranium hexafluoride gas is circulated by compressors through membranes containing a multiplicity of tiny holes so that the light isotope passes through more easily. There is a circulation of gaseous material through these membranes and it is passed on from one unit to the other. These units are repeated through the plant in several sizes. The unit operates at a minimum temperature of 140° F. to keep the uranium hexafluoride in gaseous form and at the required pressure. So the cells containing them have all to be insulated to reduce heat loss. They are contained in a vast building 3,000 ft. by 420 ft. The slide shows the interior of an uncompleted cell. The concrete floor had to be laid with an accuracy of $\pm\frac{1}{4}$ in. and a fine finish was achieved by the use of a power float. The external walls are sheeted.

The Windscale plutonium producing piles are another of the early projects of the Authority. The next slide shows their cross-section. The total loading for each pile is 58,000 tons and it is carried on a foundation raft 21,000 sq. ft. in area. The reactors are air-cooled and the air is discharged through 400 ft. high stacks 44 ft. in diameter. At a late stage in construction it was decided to put filters in the path of the outgoing air to prevent the exit of radioactive particles which might be produced by oxidation of the uranium fuel elements. The late addition of the filter galleries, weighing 2,000 tons each and the necessary lift shafts to take filters up and down have given the stacks a somewhat unusual character. The filters stop 99 per cent of the particles and this was of the greatest value to us in the recent accident. We would, however, like an even better performance, providing better protection against gaseous iodine.

Other interesting structures at Windscale are the large prestressed concrete beams (50 ft. by 3 ft.) which support the covering of the huge stainless steel tanks which store radioactive effluent. What we do is to evaporate the effluent to a smaller volume and we store it. We have a storage capacity which will last us for many years.

At the Atomic Weapons Research Establishment, at Aldermaston, the type of

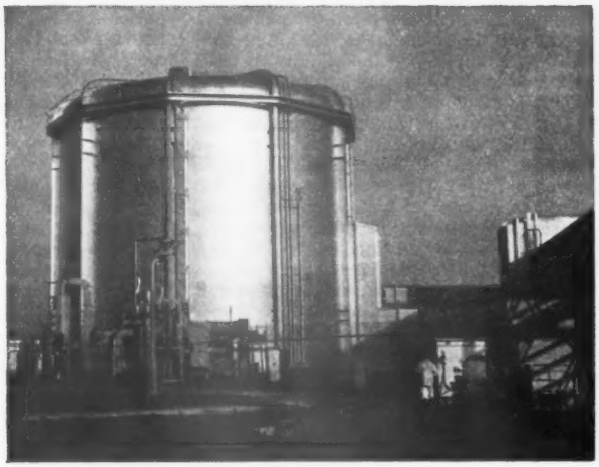


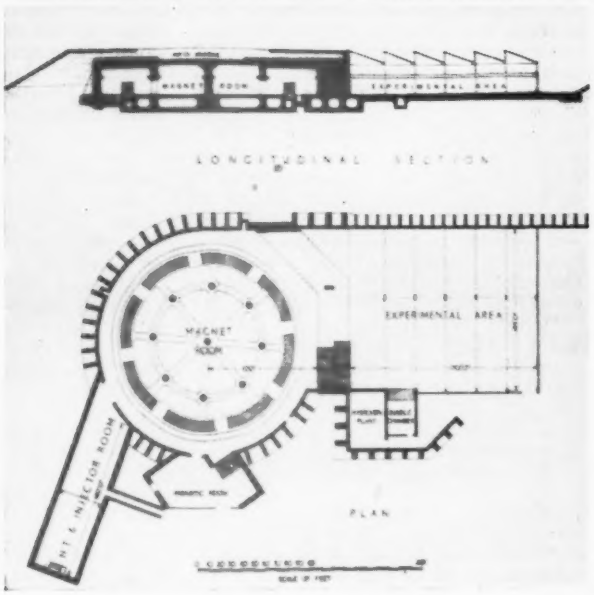
Above: DIDO, LIDO and PLUTO. 'We once asked Mr. John Betjeman what he thought of the ensemble viewed from outside and received a not unfavourable reply.'

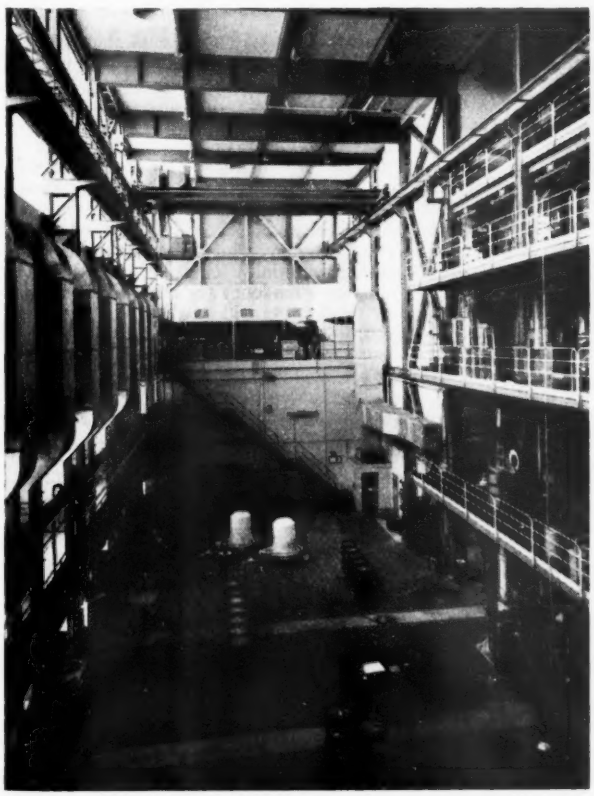
Top right: The steel shell of DIDO, which is entered through an air-lock on right.

Bottom right: Plan and section of building to house a giant proton synchrotron of the National Institute of Nuclear Physics. When completed it will be covered with 10 ft. of earth.

Below: The active chemical engineering building, Harwell.







building development has been somewhat different from that of Harwell, since the building of this establishment started almost from scratch. There are five principal groups of buildings — for radioactive research, electronics/physics, explosive and testing, metrology and engineering, and administration, welfare and stores.

The main research and development laboratories have been planned for the scientist to carry out his work in 'dry boxes' or fume cupboards, usually located in series on a process line, served from a corridor at the back from which frogmen place equipment and radioactive substances into the boxes and act as servants to the scientist. The scientist carries out his work from an operating face, equipped with control panels, remote handling gear, etc. Services, such as electrical supplies, gas, compressed air, hot and cold water, with demineralised water, drainage points, instruments and recording mechanisms, are all at his finger-tips. This is usually provided at ground-floor level, with input ventilation and extract plant situated above at the first floor. Complete changing rooms with decontamination and monitoring units are provided in all laboratory buildings where research work is done.

All finishes are above normal clinical standards, with no dust ledges. They have rounded internal and external angles, coved junctions with floor and ceilings, the whole being covered with jointless finishes. A similar treatment is given to stainless steel glove-boxes and fume cupboards, as a first line of defence. All effluents are removed to a central neutralising plant and checked before final discharge.

The most recent of the establishments built *de novo*, is at Dounreay. It has been built to house experimental and prototype reactors with their associated chemical processing plants. The central object in the landscape is the huge 135 ft. diameter sphere housing the fast breeder reactor. The object of the reactor experiment is to establish the principle of breeding fissile material such as plutonium from a material such as the abundant uranium 238 or thorium. So the reactor has a core of fissile material—about 2 ft. in diameter and 2 ft. high, in which the equivalent of 60 megawatts of heat will be generated by the chain reaction in U 235 or plutonium. Surrounding the core is a so-called blanket of uranium which will be converted partly into plutonium by escaping neutrons. Heat is removed by circulating liquid sodium and this is borne away in stainless steel pipes to a heat exchanger where the heat is exchanged with another circuit carrying liquid sodium. This in turn exchanges its heat with water and so produces steam. The liquid sodium circuit is highly radioactive so it is housed in an outer concrete shell. And finally, surrounding all is the giant sphere to contain any radioactive products which might be released from the reactor.

The sphere and associated buildings have been designed as a whole and make a very interesting group, enhancing the interest of the landscape rather than spoiling it.

The disposal of mildly radioactive effluent to sea presented a special problem since it proved to be difficult to lay a pipeline out to the required point where good effluent dispersal was possible. So a tunnel has had to be dug through the not-too-good rock, emerging at a distance of 2,000 ft. from shore.

One of the most important buildings of recent years has been the Calder Hall nuclear power station. A great deal has been written about this. In this power station two reactors housed in 37 ft. diameter pressure vessels replace the furnaces of a conventional power station. An octagonal concrete shield 7 ft. thick surrounds the pressure drums. An octagon was chosen in preference to a circular section as this gave simple shutter details for tubes and liners passing through walls obliquely. The scale is not very different from that of the coal-fired station. Instead of the high stack for flue exhaust there are comparatively minor stacks for ventilating air. There are no coal-handling and ash-handling bays. So in principle the power station can have a clean layout. The composition has to include the four giant cooling towers. I think the whole is quite pleasing and impressive with its touches of colour to provide some gaiety.

The concrete shield surrounding atomic piles to absorb gamma rays and neutrons is a special feature of their construction. A concrete density specification of 150 lb. was achieved by the use of winstone aggregate. In some reactors the use of barytes and steel shot as aggregate gave greater densities in the concrete and this had reduced the thickness. Shrinkage cracks are avoided by low water/cement ratios, and vibration and steam curing methods have been used. These shields are often pierced with tubes required for experimental purposes and these have to be located with great accuracy.

The nuclear power stations of the Central Electricity Authority are on an even greater scale. In two designs two 70 ft. spheres house the reactors in place of the 37 ft. cylinders of Calder Hall. The shrouding buildings have been cleaned up and in some cases dressed up. In the Berkeley station the six heat exchangers surrounding each reactor have been left exposed and add to the interest of the design.

There has been a great deal of public debate on the siting of nuclear power stations. Since they have outputs of up to 500 megawatts they require increasing amounts of cooling water for condensing the steam—just as conventional stations do. So they must be sited on large rivers or estuaries or the coast. The sites must have good foundations to support the great reactor loads, and the site must not be too high above sea-level. In addition the Government have added the requirement that they should, for the time being, not be too near towns until we have more experience of their operation. If the site selector puts all these criteria on a map he is left with a limited range of sites. So it is obviously good policy to develop as much power as possible or convenient from the chosen system on any good site. Within these limitations the designer has to do his best with architectural advice to fit the power station into the landscape.

During the eleven years of its life the Authority has built three-and-a-half thousand houses for its staff. There is nothing very remarkable about the houses except that they are well designed as we would expect from the Ministry of Works. They have been laid out with rather more space around them than the average local authority establishment and we have also brought back with us from Canada their practice of having common lawns in front of the houses. We have also preserved all possible trees and taken advantage of the contours of the ground. For many of these layouts we are indebted to Mr. Hopkinson of the Ministry of Works and I will show slides of a few of these.

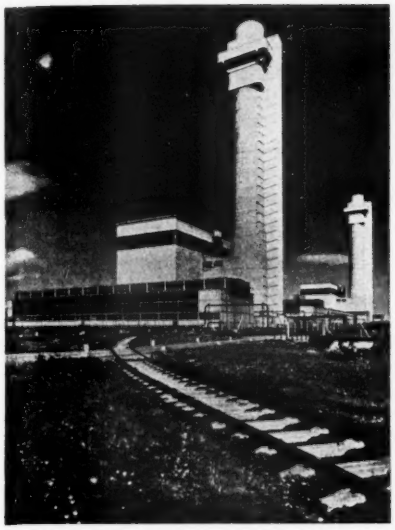
A recent article in the technical press by Mr. Dex Harrison discussed the question of whether the advent of nuclear power will in the long run lead to an increasing use of electrical heating of buildings particularly for off-peak heating.

The main facts of our future energy supply are already fairly clear. We are likely to require in addition 120 million tons of coal equivalent by 1975 and of these only 25 million tons at most are likely to be provided by increased coal output. The balance of our increased energy requirements must therefore come from increased oil imports and from nuclear energy. Under these circumstances the greater part of our electricity is likely to be generated by nuclear power stations by 1975 and more than half of our additional thermal load of about 60 million tons of coal equivalent a year will have to come from imported oil, unless some of this also can come from electrical space heating.

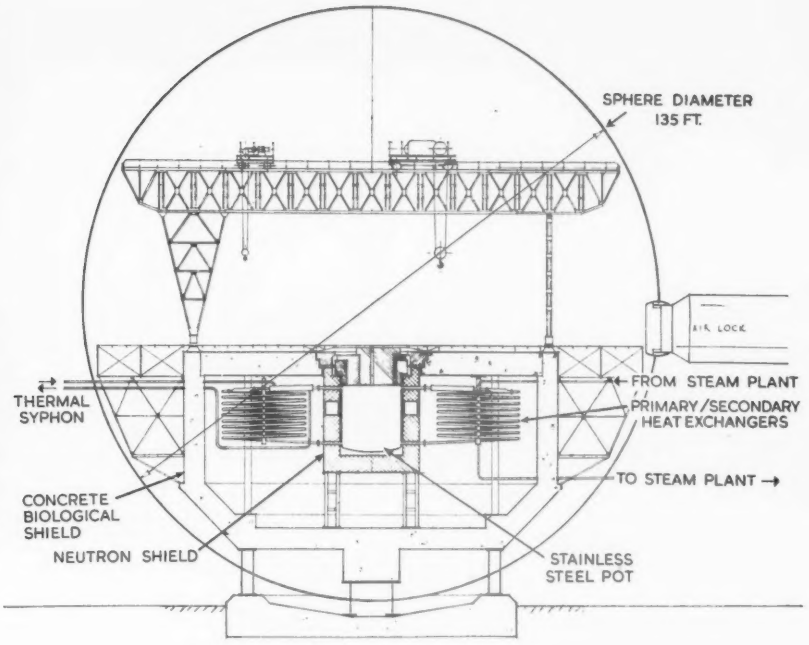
We should also take note of the prediction by Sir Christopher Hinton, Chairman-Elect of the Electricity Generating Board, that by 1975 nuclear power generating costs should be about 70 per cent of present costs in real money, whilst oil costs are likely to rise substantially. There will, therefore, by then be a tendency for electrical heating to be much more widely used than at present, especially when used in thermal storage systems so that the electricity can be taken at off-peak periods.

At Harwell we have used the waste heat from our BEPO reactor for heating buildings for several years. A heat exchanger is placed in the outflow of the cooling air and water is heated to a temperature of 160° F. This is then distributed to heating points in surrounding buildings. By this means we save about 400 tons of coal a year.

The Swedes are conducting a more ambitious experiment to use a nuclear reactor to supply hot water at 120° C. for district heating at Vasteras. The reactor will be moderated by heavy water and will supply the heat equivalent to 7,000 tons of coal a month. The Swedes believe that they can sell hot water at about the current commercial price and break even. A second reactor is being built to supply a new Stockholm suburb at Fasta with heat together with

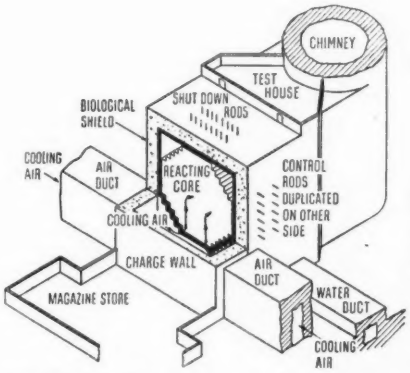


Windscale. The reactors are air-cooled and the air is discharged through 400-ft. high stacks 44 ft. in diameter.



ARRANGEMENT OF REACTOR

Dounreay: section through the 135-ft. diameter sphere housing the fast breeder reactor.

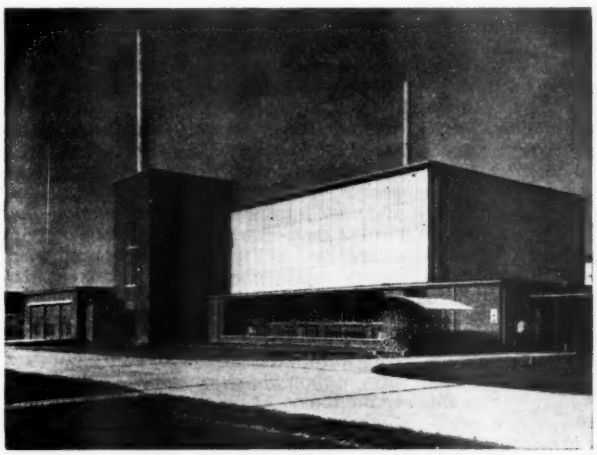


A schematic sectional diagram of a Windscale pile from the front.

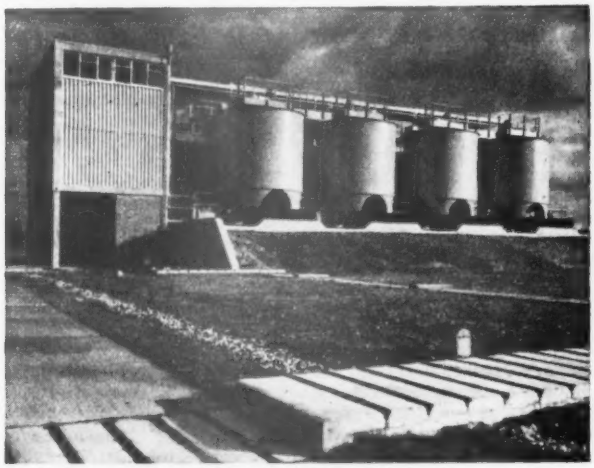
15 megawatts of electricity. We are following their experiments with great interest. We shall be especially interested to see how the economics work out. One has to bear in mind that the Swedes have a substantially longer heating season than we have.

The buildings I have described have been designed and directed by the architects and engineers of the Ministry of Works, while the later buildings of the Authority have been designed by Mr. Viney, Mr. Dixon and Mr. Brockley and their colleagues, many of whom came from the Ministry of Works. My own part has been confined to taking an interest in the buildings, expressing an occasional preference for one design or another and taking time to discuss layout and similar problems with Sir Charles Mole on the occasion of his well-known Saturday morning visits.

In the preparation of this paper I have relied a great deal on memories of the past supplemented by the help of Mr. Viney and Mr. Dixon.

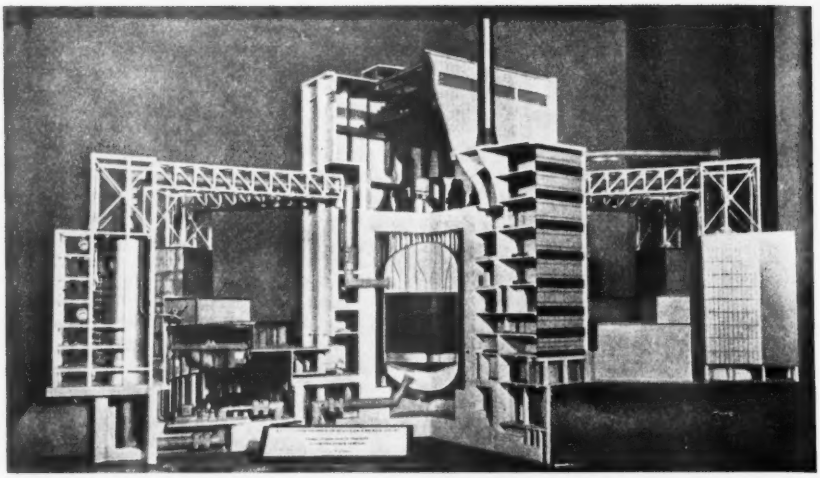


The Atomic Weapons Research Establishment, Aldermaston.

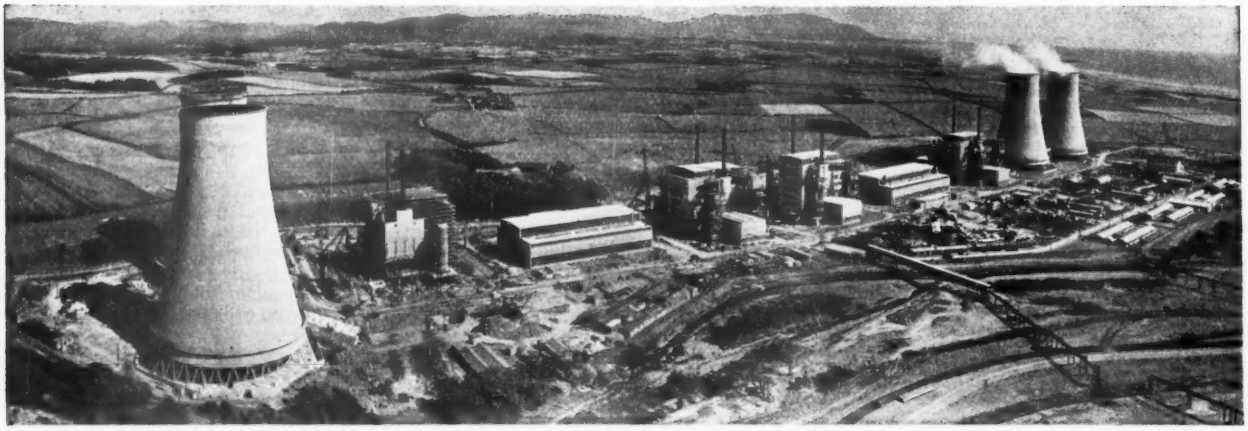


The effluent treatment plant at A.W.R.E., Aldermaston.

A view from the top of the biological shield of No. 1 reactor of Calder Hall 'B' power station showing the thermal shield.



In the Berkeley Station the six heat exchangers surrounding each reactor have been left exposed.



A general view of Calder Hall showing the completed Calder 'A' Station on the right with Calder 'B' under construction on the left.

VOTE OF THANKS AND DISCUSSION

Sir Charles Mole, K.B.E., M.V.O. [*F*], Director-General, Ministry of Works: Sir John has given us a most interesting paper on the building work which has been carried out for atomic energy and has summarised most ably what has been accomplished during this development period. I am honoured to have been asked to propose a vote of thanks.

In recent years the association between scientists, architects and engineers has been steadily increasing and becoming more important. The task of the architect is to provide the right kind of building, laboratory or workshop fitted with the most modern equipment, and it is quite reasonable for the scientist to expect from the architect an orderly and economical solution to his problem. One of the major difficulties when designing is to find out just what the scientist wants, for the very nature of his work makes it difficult for him to bring his requirements down to something fairly concise and for him to visualise his future needs. At the same time he has to remember that such buildings and equipment are very expensive and cannot lightly be altered or discarded. This means that a compromise is usually necessary at a point somewhere between the ideal and the practical, bearing in mind that to be of maximum use the buildings may have to be provided as rapidly as possible, and sound judgment and firm control is necessary to determine at what moment the design should be finalised.

Twelve years ago, when I was one of a team who visited Harwell to determine whether it would be acceptable for development as a nuclear research establishment, I realised that a challenge was to be made to the Ministry of Works and that it was up to us to meet that challenge in the best possible way. One readily saw that one of the fundamentals for success was to get a good team of architects and engineers—and indeed all the building professions—working side by side with the scientists, at the same time keeping a fluidity of organisation so that specific problems could be studied on the site and transmitted to headquarters for further development. This pattern of staff distribution and general control continued up to the time of the formation of the Atomic Energy Authority when the Ministry of Works staff at Risley, some 300 strong, headed by Mr. Viney, were taken over to form the main core of the building organisation now operating from that centre today. At the same time, the Atomic Energy Authority thought it right, no doubt after consultation with Sir John Cockcroft and Sir William Penney, to

continue the services of the Ministry of Works at Harwell and Aldermaston for a further three or four years. The atomic energy work carried out by the Ministry has amounted to about £100 million and at one time there were over 1,000 staff engaged on this programme.

As you may well imagine, the problems which we met with during this development period were varied, but always interesting. One of the first was to get as dense a material as possible around the reactors in the least thickness. The scientists used to bring along their instruments to find out not whether the concrete was strong enough but whether it was sufficiently dense to withstand the gamma rays, and I may say that we have had our anxious moments, particularly in one case where very special measures had to be taken to increase the density at certain points when the concrete was already in place. That was not at Harwell.

The utmost accuracy had to be insisted on in many sections of the work, as Sir John has already mentioned this evening. In the first pile of any size which we built about nine or ten years ago the tolerances allowed in forming thousands of holes through 4-ft. thick concrete walls, to be sighted through from one side to the other —about 40 ft.—was just two-thousandths of an inch, which was quite a precision job.

The raising of thousands of tons of material and equipment to the top of the 400-ft. towers at Windscale for the additional filters was no mean structural achievement. It was quite an experience, instead of being hoisted up in a bucket or an erratic mechanical lift, to go to the top in a pukka lift on the outside of the chimneys and to look down from that height on the work which had been done.

Another task, to which Sir John has already alluded, was the separation of the reactive and innocuous drainage and then bringing them together again after treatment for discharge into the river. A most interesting project is to carry a pipeline out to sea for a few miles: you can imagine the practical considerations. Over all this was the problem of letting literally hundreds of contracts for both the building and engineering work and keeping up the pressure to achieve a very tight programme. This meant that in addition to those in charge keeping a very close watch on the work an efficient progressing section had to be found. I can say quite definitely that without the interest and enthusiasm of the building and engineering contractors the problem would have been almost insoluble.

From the core of experience which we gained on the first schemes and the pattern which was presented to other organisations, there has been a spread of knowledge so that the technique associated with building for atomic energy is now widely known, as evidenced by the groups set up for carrying out major schemes both here and in other countries.

The atomic energy programme, however, is one which I would not have missed for anything, and it gives me great pleasure to have been associated with Sir John over many years. My section of the Directorate-General of Works who have been responsible for the programme, under the Assistant Chief Architect, the late Mr. Manuel, and now Mr. Curry and the Assistant Chief Engineer, Mr. Wilson, are very proud to have taken part in this unique development. I thank him for the very kindly references he has made to my work and I have very much pleasure in proposing a hearty vote of thanks to him for a very excellent paper.

Mr. T. L. Viney [*F*], Department of Atomic Energy, Risley: I should like first to endorse the remarks made by Sir John concerning the wise direction of the construction side of the atomic energy work by Sir Charles Mole. I think it is fitting at this stage of his career to emphasise how well he has handled a very vast and rapidly changing problem. May I add my personal thanks to him for setting me on a very sure foundation?

I think my first love in the atomic energy field was at Harwell, but for many years now I have been divorced from this and located in the north doing work in connection with the Industrial Department of the Atomic Energy Authority. Construction has followed so close upon design that it has inevitably been a hand-to-mouth existence, and in fact it has often appeared to me that the job on site would be completed before the drawings had been finally issued! Nevertheless, in spite of this constant race against time, our profession must be ever grateful to Sir John no less than to Sir Christopher Hinton for insisting that the planning and general lines of the various structures should receive proper consideration.

To enable projects to be completed to the tight schedule it has been necessary to give ample space around each structure so that it could be adequately planted up during construction. In the case of Calder the original designs provided a closely knit composition. Its grouping was subsequently opened out to permit of maximum construction effort and full planting of the job over long periods for each section. To enable the parts of the pressure vessel to be lifted into the reinforced concrete biological shield a stick, capable of taking the heaviest ring, i.e. 120 tons, had to be provided and this required guys anchored to dead men located in selected places in remote corners of the site. Careful planning was necessary to ensure that these in no way interfered with the general planting of the job.

Looking farther back to the Windscale days, I am thankful, I must admit, that the structural engineers provided foundations for a pile chimney 50 ft. higher than that envisaged at the time, because otherwise the filters at the top of the chimney could not have been introduced.

In the heyday of Windscale construction, drawings were issued to site on a day-to-day basis in order to keep 5,000 men busy. But so far, on all these jobs of an experimental nature, both contractors and men have co-operated and have given us very fine service. As can be seen with all this very tight programming a good feeling is essential between design staff, site staff, contractors and men, and I have no hesitation in saying that this has been achieved.

There is probably no need to remind you that Harwell is visited by cultured people from all over the world, and they come not only to see the various projects but also to sit at the feet of the Director. You can safely gather from his lecture this evening that we are fortunate, therefore, in having in Sir John a man with a considerable knowledge of architecture. I wonder if architects know much about nuclear energy. I do feel, however, that the treatment of the present C.E.A. nuclear power stations shows the right trend. The architectural profession has allowed twelve years to pass since the advent of atomic energy in this country before inviting Sir John to speak on this subject. Otherwise I am sure that Sir John would have been here years before. On the principle that it is never too late, and the fact that it is usually some thirty to forty years before a new invention becomes a real standard, I strongly advocate quiet digestion of the various thoughts which lie behind the paper presented to you this evening.

It should be possible for the physicist, the engineer and the architect to work side by side to ensure that the composition as a whole is correctly interpreted, and I offer to architects the thought that a new conception must be introduced into their creative work, namely, the housing of plant. The physicist and the engineer rightly say that it is up to the architect to frame plant to display its virtues, not to conceal them.

The profession will be encouraged by the thought that Sir John, in spite of all his problems and tasks, has yet found time to give consideration to the seemly appearance of buildings, and I have much pleasure, on your behalf, in seconding the vote of thanks.

Sir Josiah Eccles, C.B.E. (Deputy Chairman of the Electricity Council): If a sub-title was required for this paper I would suggest 'Fitness for Purpose'. That is a theme with a wider application in the necessity for co-operation between the engineer, the physicist and the architect in these great structures of the future. It applies particularly in the field of atomic energy and more generally in the industrial field.

Whilst it is true that the engineer and physicist must have their way in designing the plant, unfortunately for the person who has the overall responsibility, the ordinary layman sees the structures only from the outside. Consequently it is of extreme importance that whilst they are suitable for their purpose they should be aesthetically acceptable in their surroundings. I should like to express the hope that there will be continued and close co-operation between the three branches of science or technology engaged in this process. I should not like it to happen as in a story I heard this afternoon on my way to Twickenham

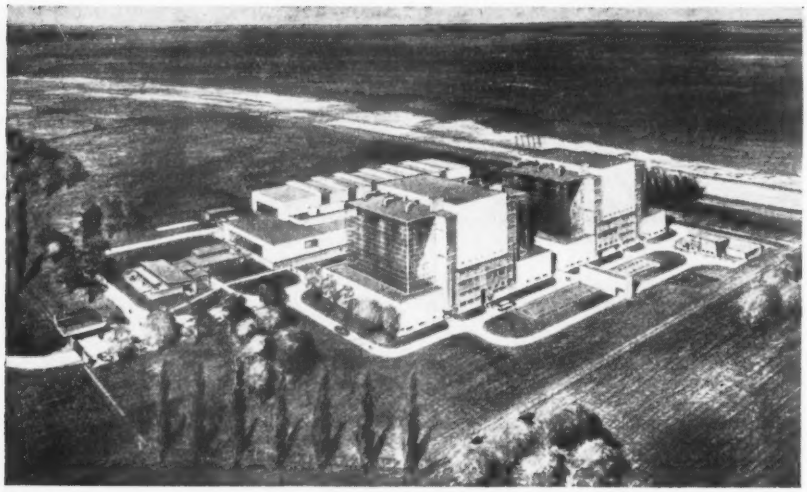


FIG. 1

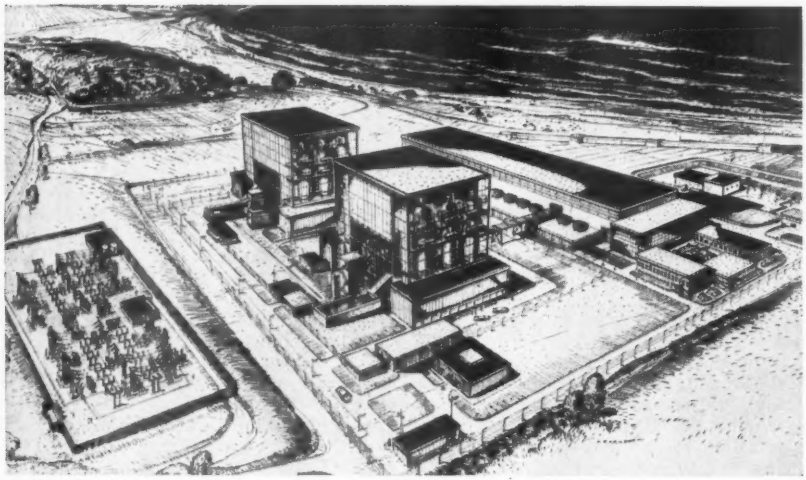


FIG. 2

when taking an American friend to see certain things there. He told me of an architect who joined the American Naval Department and who was taken into the presence of a famous Rear-Admiral. When the Admiral discovered that he was an architect he said, 'Sorry, you have come to the wrong Department. We need no frills on our buildings'. That is a completely wrong-headed attitude in relation to what the architect can do to help the engineer and the physicist in this work.

Sir Josiah then showed some slides on which he made the following comments:

Fig. 1. This shows the Bradwell Power Station, one of the first two in the programme for commercial development. The two reactors are in the front of the picture, and the heat exchangers are enclosed in the wing structures on either side of the reactors. The power station proper—the turbines and generator—is in the background. That is only an artist's impression but it is the kind of thing we wish to do to fit these massive structures into the landscape. It is fairly easy to do local landscaping and make the thing look well from the point of view of the person who is within two or three hundred yards of the premises, but some of these structures are 186 ft. high and it is quite a problem to fit them into the general landscape. If we design them well, probably in future these large buildings will be looked upon as the scientific monasteries of the 20th century, and I hope that they will endure until a non-scientific Cromwell comes along to demolish them.

Fig. 2. That is a similar impression of the Hinkley Point station in Somerset. In this case the reactor is in the background. In the bottom foreground there is a series of screens for removing rubbish from the water intakes. We hope that it is a not unpleasing arrangement and we hope very much to be able to fit it into the landscape.

Fig. 3. That is a picture of the foundations at Bradwell showing, so far as one can in a single slide, the mass of structure required

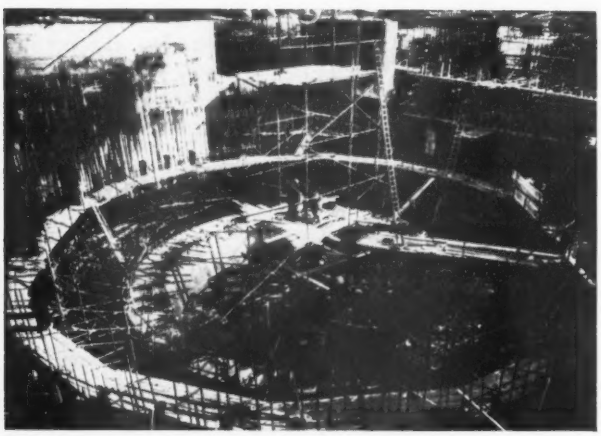


FIG. 3

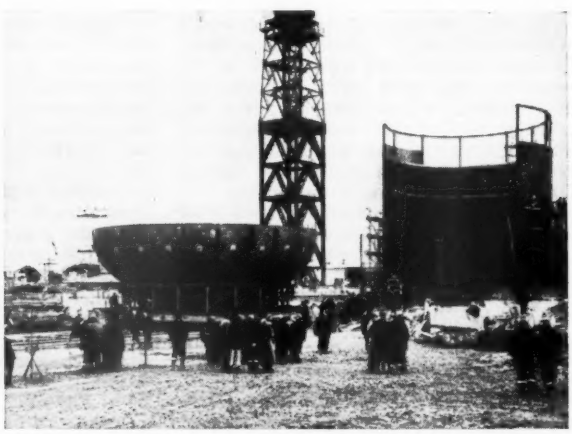


FIG. 4

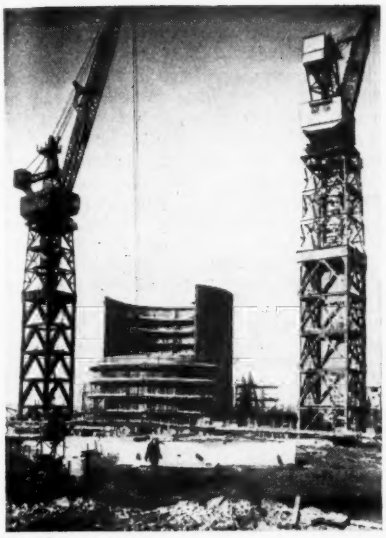


FIG. 5

below ground to support these very heavy buildings.

Fig. 4. That is Berkeley, and the vessel in the foreground is the lower dome of the reactor itself. It is 70 ft. in diameter, is all welded, and the plate is rather more than 3 in. thick. That portion of the vessel which is in position ready to be moved into its final position weighs about 200 tons. It is quite a problem to weld a structure of that kind on the site in such a way that it will be satisfactory for its purpose because the working pressure inside will be something like 120 lb. per sq. in.

Fig. 5. This shows the next stage. The bottom of the pressure vessel is in situ and the thermal shield is being placed.

The only other comment I would make is with regard to the figure Sir John quoted of 120 million tons of coal equivalent which will be the additional requirement by 1975. I think some of our prophets have been rather mesmerised by the rate of increase of energy usage since the war. First we must remember that we ended the war with a substantial deficit in our energy usage and we have been in a sellers' market with unlimited reconstruction, so that the rate of increase in the use of energy has been unnatural. I think myself that the rate of increase of productivity represented by 120 million tons of additional coal equivalent by 1975 is somewhat outside our reach. Heat is the most usual form of energy in common use, and I should like to make an appeal to my audience to do what they can to create buildings which will conserve heat and not simply act as chimneys or radiators for its dissipation. Apart from the aesthetic value of your work probably the next most important aspect is to provide structures which are designed and insulated to conserve heat, and so do your best to falsify Sir John's pessimistic statement. You will be doing an immense amount of good to the country if you can save that precious commodity, heat.

Professor Sir William Holford, P.P.T.P.I., F.I.L.A. [*F*]: May I say that I think Sir John's lecture was most interesting and exciting for architects? The first point is that he is the head of an enormous establishment and he has taken the trouble to write a programme. That is, I think, a most essential point in our future progress in the field of atomic energy in all its forms. He has taken the trouble to go into great detail and come and explain it to us in clear terms and that is an extremely useful precedent. I wish we had more clients who would take the trouble to write a programme as clearly as he has obviously been prepared to do.

The second thing is visionary and I was very excited by the possibilities for the future. Clearly there is very little of the work of art about our present layout in connection with atomic energy. I do not say that the layouts are unpleasant or uncomfortable. Some of the housing and other units are extraordinarily good and fit for their purpose. But the whole thing, the unity, the work of art as we understand it, has, of course, still to be achieved and it is not to be wondered at that that is so. All through the lecture and the slides there were these extraordinary hints of things that might be achieved and dreamed of by architects ever since the days of Homer.

The Homeric requirements at Aldermaston have a fine degree of join and that perfect finish which Homer talked about has come back in a new form. Another thing is the Dounreay sphere. Those of you who remember how in the 18th century Ledoux dreamed up shapes for one of the first ordnance factories ever completely envisaged by an architect will realise that it is an exciting illustration of what in fact is going to happen when the total scheme—the background and details, the extraordinary elements of construction—is brought to the same pitch as other works of art have been over the last centuries.

There is another point which interested me. Sir Josiah Eccles and Sir John Cockcroft talked of fitting these buildings into the landscape. There I would rather take issue with them. They remind me of those benevolent hosts who, when you are departing from Paris by air with a small suitcase, rush out with a case of brandy and say 'Put this into your handbag'. I do not think we can fit these buildings into the landscape. We must create them with a landscape of their own. If economics drive us to produce larger and larger units of generators, boilers and reactors I believe that we shall have to stop thinking of the problem as being an assault on the fair face of this tiny country and think of it instead as being an enormous opportunity to create a greater and quite different amenity. I realise that this is something which I cannot speak about in three minutes, but I feel that, as architects, we have got to change our point of view. Instead of trying to minimise and reduce the effect we must grasp the totality of this problem, and when we go into Wales, where we shall be going into new country, we must use all the devices of design, orderliness and landscape formation to create the landscape of the atomic age.

I should like to thank Sir John very much indeed for his very provocative and interesting paper.

Mr. L. N. Fraser [*Student*] (Deputy Planning Adviser, Essex): I have had something to do with the receiving end of a power station coming into a rural area. The responsible local authorities in Essex are very pleased with the design at Bradwell, but I should like to mention another thing which has not had so much publicity. The power is generated and then put into a transmission line. That process has had a lot of publicity, but what is not discussed in public is the fact that it is also necessary to have switchgear stations and sub-stations. These have always been required for power stations, but because these stations have been sited in industrial areas the switchgear installation and sub-station are generally not noticed.

These nuclear power stations are now going into rural areas and they are very big things in the landscape. All the artists' impressions and perspectives of nuclear power stations published in the papers and shown on TV do not show the switchgear. At Bradwell this will cover 10 acres. If you look at the plan you will see that it covers a greater area of ground than the reactors and turbine house. There are 40-ft. high reinforced concrete Tee beams to carry overhead lines for the switchgear and two transformers. There is one at Elstree on the Watford by-pass. It has caused great concern at Bradwell, and it will occur wherever another power station is sited.

It is an administrative accident. The Central Electricity Authority lets the contract for the building of the power stations, but everyone forgets that it is necessary to have switchgear and a sub-station. Much attention is given to the power lines, but by an accident the Minister of Fuel and Power gives a 'D' planning permission for the erection of a power station, and consults the local authorities and when it comes to the erection of switchgear and power lines the Central Electricity Authority has to get ordinary planning permission under Section 14. That is a peculiar thing in many ways and causes great difficulties. On the other hand, it gives the local planning authority a very big say as to where the switchgear is to be sited.

The lesson learned at Bradwell is this. The first siting of the switchgear was at the top left-hand side and would have been disastrous. It is now sited at the back of the power station on an old airfield, right in the way of the main entrance to the power station. It is a lot of ironmongery and is very big indeed. The Central Electricity Authority applied for permission to put it on level ground and to put a chain link fence round it. Now they have agreed to sink it into the ground and the county council took the rather unusual step of asking the President of the Institute of Landscape Architects to advise the planning authority on what should be done to

absorb this switchgear. The power station is acceptable.

The speakers this evening have said that it is the architect's duty to make a plan which will bring out the best points, but I think that much attention must be given to the switchgear stations of which there will be many. We shall have coal and oil-fired stations, and we shall have them at other junction points on the grid where there are no power stations. Why cannot some architectural treatment be given to these switchgear installations? First of all, why cannot they be designed with the power station or, if that is not possible, why cannot they be related to the design as a whole? When the question was put to the Central Electricity Authority as to why the switchgear could not be put into a building or dealt with by means of an architectural approach the answer given was that it was a matter of cost. They also said that all the equipment was outdoor equipment and that there was no point in putting it into a building. As a layman it strikes me that there must be a good deal of salt in the air and consequently a good deal of corrosion.

Mr. Lesslie Watson [*F*]: I should like to enlarge a little on what has been said by Professor Holford and the last speaker about fitting a power station into a country site. We have to do with some of these stations in our office and we sometimes find that the amount of land acquired by the Central Electricity Authority is just big enough for the power station itself. That means that there is no chance to do the landscaping which is necessary. Having heard the last speaker I can understand now why it is that we never discover until nearly the end what is going to happen to the transmission. If it has to go through ordinary planning processes, and it can be held up, that is perhaps one of the reasons. However, the various sides of the industry are in very watertight compartments and I hope the forthcoming reorganisation will overcome this failing. Those of us who have to do with these things are delighted to know that Professor Sir William Holford is going on to the Generation Board of the Central Electricity Authority.

Mr. Walter Goodesmith, A.M.T.P.I. [*F*]: Mr. Chairman, with regard to some of the industrial developments of atomic energy, may I ask Sir John Cockcroft, through you, whether he thinks that there has been some deterioration of that early close collaboration of the architect which was commenced at the Ministry of Works and continued later at the United Kingdom Atomic Energy Authority's own Directorate of Works and Construction.

With the bringing into being, in various forms, of the large consortium of electrical, mechanical and chemical engineering and the civil engineering and building main groups to carry out programmes for the new atomic power stations, the architect seems to be farther in the background than his potential contribution merits in such national undertakings.

If we are to get the best results he should, surely, be more of a basic partner in the conception throughout all its stages, because of his natural feeling for co-ordination of design, planning, construction and services generally.

We have had too many examples in the past of this failure to use fully the services of the architect, as has so often been the case in the more normal types of electricity generating stations.

In the designing of atomic power stations is it not, therefore, very important for the architect to be an early and full collaborator in the project as a whole, instead of being limited mainly to housing and clothing the 'giant' and arranging the setting?

Mr. G. A. Carter [*A*]: I was very interested in the diversity in the initial layout of these atomic plants, and I should be intrigued to learn how much of that diversity can be attributed to the architectural side.

Mr. J. Whitehead [*Student*]: I understand that these power stations have been designed for a life of twenty years, and presumably they may be used for a little longer than that. I imagine that they will not be used for very much longer—it will be like running vintage cars in that they will be so inefficient compared with newer types. A lot of the concrete is 11 ft. thick, and each reactor forms a cube of about 200-ft. side, so they are enormous things and enormously permanent. Yet they are only designed for a life of twenty years. They will therefore stand for much more of their life as ruins than as power stations. I think that we should spend as much time thinking about how they will look as ruins as how they will look as power stations.

In spite of the superficial variety of these stations those built and those projected are very much alike in their basic layout. But there are many other possible ways—the core can be built upside down as it were (which is being done at Hunterston) or on its side (as at Marcoule) or even buried in the ground. The core, heat exchangers and turbines could be related in quite different ways. We should not stop thinking when we get one design which works. Another way might well be better.

When the reactors are built in the usual way above ground they require heavy concrete biological shielding. Each reactor weighs about 70,000 tons and requires a large, deep raft. The high loading virtually limits sites to those on solid bed-rock. If the pressure vessel were underground the earth would replace a lot of the shielding and greatly reduce the weight. Also the load would be taken lower down where the bearing stress is higher. So sites on most types of soil would be feasible. Cost would be much reduced too. The buildings required would be relatively light in weight and easily demolished later.

Mr. J. F. Munce [*A*]: For the last five years the American Institute of Architects has had a committee studying the position of the architect and the contribution which he can make to the nuclear energy scene. Members of that committee have told me that although there will probably be a vast amount of work for architects in connection with laboratories and accelerator buildings, they envisage very little scope for the architect in reactor buildings. Nevertheless this year thirty-one competitive designs were received by the American Atomic Energy Commission for reactors. There has been a very big change in the scene, and I would suggest, in support of an earlier speaker, that this change was brought about by the fact that the American architect, in co-operation with the engineer, has taken the trouble to study the processes which take place in nuclear fission with the result that he has been able to make his mark on the scene and has been able to persuade his engineering and chemical brethren that he is talking about something which he fully understands. When certain things are asked for which the architect feels would be against the principles of good architecture he can persuade the engineers and chemists that if they can alter certain processes and do them slightly differently architecture will benefit.

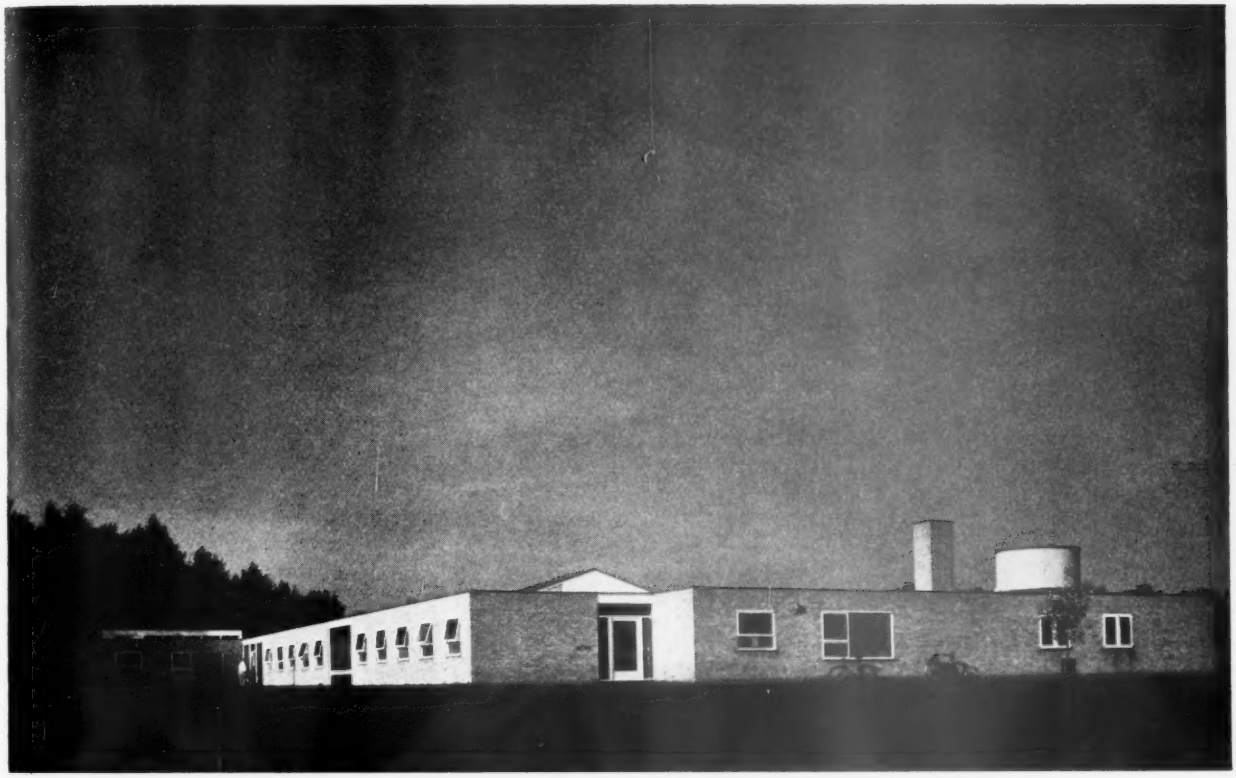
Mr. K. Crisp [*Student*]: I wish to know whether the determining plants using sea water will make uranium and plutonium plants obsolete. Presumably in any case they will be very much smaller in size. I believe that the gigantic mechanical plant attached to the existing types becomes unnecessary because there is a direct feed into the grid. Also, the cooling towers will be replaced by propeller fans which will dissipate the fumes and waste matter. In general scale they will be very much easier to fit into the landscape.

The vote of thanks to Sir John Cockcroft was put to the meeting, and carried by acclamation.

Sir John Cockcroft: I feel that Sir Josiah Eccles should have replied to the discussion on the Central Electricity Authority's power stations and transformers. Before he left the meeting he gave me a note saying that the switchgear was now being planned at the same time as the power stations.

I fully agree with what was said about the importance of bringing in the architect from the beginning in new projects of this kind. When Sir Josiah Eccles spoke of landscape formation I was thinking about the same kind of thing when I was talking about fitting buildings into the landscape. Landscape formation is very important.

A question was asked about whether or not power stations could be sunk into the ground. In Sweden they are. In fact the Swedes sink all kinds of things into the ground. If you have solid rock it is a good thing to do. I have also been asked to look into the crystal to see whether, when we get power from hydrogen instead of uranium, power stations will be smaller. I think that is looking a quarter of a century ahead, and I should not like to say what the architects and engineers will be doing a quarter of a century from now.



The Nuffield Diagnostic Centre, Corby, Northants

Architect: R. Llewelyn Davies [*F*]. Deputy Architect: John Weeks [*A*]

THIS BUILDING was awarded the R.I.B.A. Architecture Bronze Medal in the area of the Northamptonshire, Bedfordshire and Huntingdonshire Association of Architects for the three-year period ending 31 December 1956.

The Nuffield Diagnostic Centre at Corby is not a 'health centre' in the accepted sense, as it is not provided by a local health authority. It is an experiment sponsored and in part financed by the Nuffield Provincial Hospitals Trust. It brings together the general practitioners of Corby and certain hospital services provided by the Kettering Hospital, eight miles away.

The family doctors of Corby retain their existing surgeries, but patients needing more complete examination or investigation are given appointments at the Diagnostic Centre, where the general practitioners rent some of the consulting rooms. Here the doctors are able to examine their patients, away from the rush of the surgery, and can consult any of their colleagues or arrange consultations with the visiting specialists.

The Oxford Regional Hospital Board provided, and staffs, the chest clinic and X-ray and physiotherapy departments; and its consultants and specialists use some of the consulting rooms, while general practitioners use others.

The design of the Diagnostic Centre at Corby is based on a number of positive aesthetic decisions as well as considerations of planning and economics. The planning requirements called for two kinds of interior space; public circulation and waiting areas; and individual rooms for consultation, treatment, etc. The rooms were grouped into enclosed blocks completely separated by the public spaces which flow round them, reaching the outside wall to form local waiting spaces. Thus, the design can be seen as an archipelago, each block of rooms is like an island, in a sea of surrounding free space.

The rooms are lit by windows set in brick walls, underlining the enclosed nature of the island blocks. Circulation spaces are lit by large sheets of plate glass extending from floor to ceiling and from wall to wall to separate the room blocks clearly, both externally and internally. The brick walls enclosing the room blocks are unplastered but the rooms within the blocks are plastered. Some blocks of rooms are in facing bricks, inside and outside; other blocks are of fairfaced brick, painted. Three colours are used—light grey (N8), blue (2PB 6/8) and green (5.0 G 5/6). The floor has a large chequer-board pattern in black and white extending throughout the building. The pattern is set out in squares, 1 ft. 6 in. × 1 ft. 6 in. and passes into the rooms, without a break. Ceilings, plastered throughout, are white.

Open waiting spaces are on either side of the building, and staggered in relation to each other so that light enters circulation areas from alternate directions. Each block of consulting and examination rooms is placed opposite its local waiting area.

The shape of the public areas is easily appreciated as soon as the building is entered and it is therefore easy for a patient to find his way about.

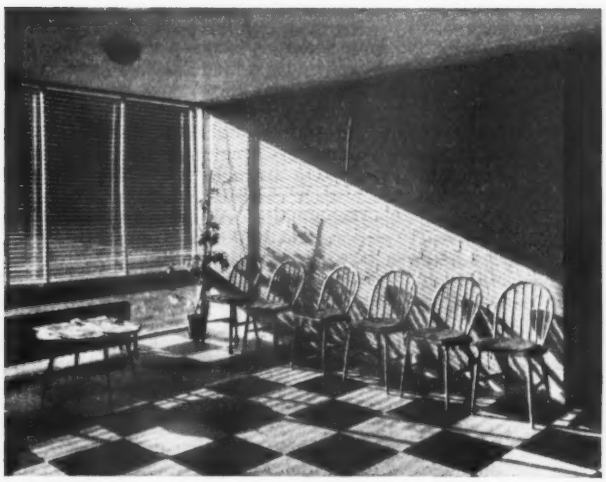
The building called for no large spans, nor for structural adventure, and the resultant very simple structure—brick walls supporting a timber roof—is not stressed as a design element.

The building was completed and occupied in 1954, at a total cost of £35,023.

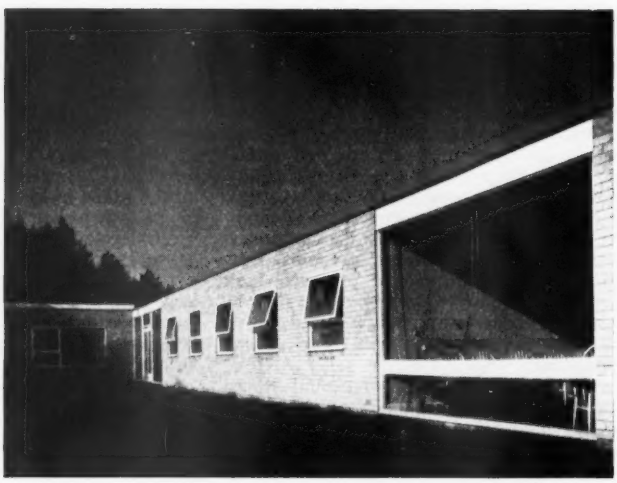
The chief assistant to the Architect, Richard Llewelyn Davies, M.A. [*F*] and the Deputy Architect, John Weeks [*A*] was Walter Goddard.

Associated Architect: K. J. Allsop [*A*] for Messrs. Gotch, Saunders and Surridge, Kettering. Quantity Surveyor: Messrs. Gotch, Saunders and Surridge, Kettering. Mechanical Engineering Consultant: Messrs. J. Roger Preston and Partners. Contractor: Messrs. A. Tailby and Son, Ltd., Desborough.

Nuffield Diagnostic Centre, Corby: the entrance

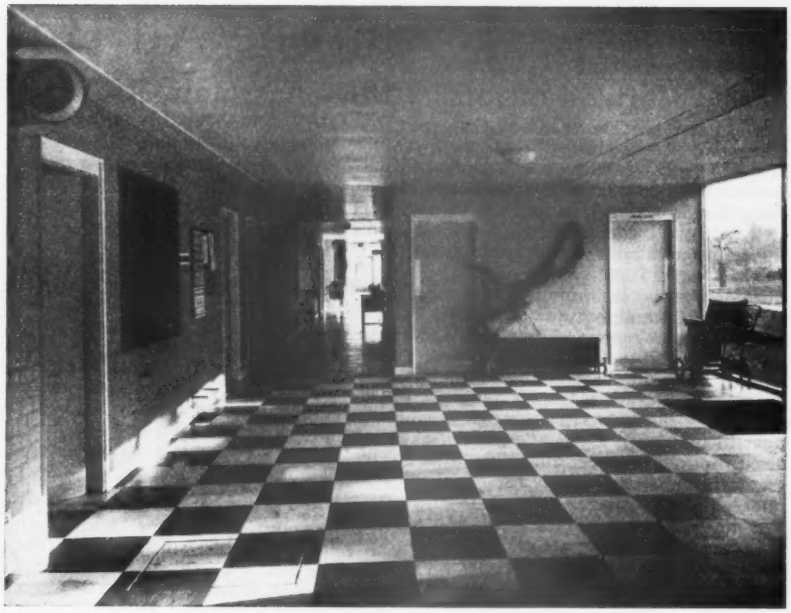


A waiting space



Clinic wing

Typical lighting of circulation space



Main entrance hall

PHYSIOTHERAPY

X-RAY & CHEST CLINIC

Two Papers from the Ad Hoc Committee

With an introduction by the Chairman, Richard H. Sheppard [*F*]

OF THE TWO PAPERS printed below, the first aims to identify some ingredients of professional status, to examine those that are within the profession's control and to set the background against which the Committee's programme of work may be viewed.

This is not an agreed document in the sense of having been minutely combed through in Committee until unanimity is reached on every point. There are a few views expressed with which not every member agrees; but the Committee support the document as a whole and are unanimous in the belief that it poses problems which ought to be frankly faced and widely discussed. Indeed we feel that this article deserves some special emphasis; for these are the kinds of general reflections which form the background of our work and as they are necessarily speculative, it is neither possible nor practicable to embody them in a formal report.

Reports from our Committee to the Council are factual, recommendations being the end product of our deliberations, from which the intermediate steps are often necessarily omitted. These notes, however, were thought by the Committee to be so interesting and controversial as to merit publication in the JOURNAL. In itself this is an unusual and welcome departure from precedent and we are grateful to the Council for permission to publish: it shows that the profession has the confidence and energy to examine its own position and influence in relation to society.

It has been suggested that members may like to know in outline what practical action we have in hand at present. Brief references are made to this towards the end of the Professional Status paper, but the following is a summary:

(i) Of the biographical questionnaire forms issued to members last summer, some 10,500 have been completed and returned to us. These are being coded and analysed to yield, among other things, the distribution of members by type of occupation; the identity of employers of architects where this is not already known; the educational background and age structure of the profession; the sizes of offices and so on.

(ii) In collaboration with the Royal Commission on Doctors' and Dentists' Remuneration, early in the New Year an income inquiry, which will be strictly confidential, is being sent out to a sample of the profession. As several other professions are co-operating in the same way, this should afford the most substantial and reliable comparative study of professional incomes that has yet been attempted.

(iii) We have been much occupied with plans for the formation of a local Government Architects' Society and with the chances of bringing about some new and more effective negotiating machinery for the major professions in local government. By the time this issue is in print, members concerned will have specific proposals before them.

(iv) Last summer a survey was conducted of 14 county and six other local authority offices to study the relationship of salaries earned to responsibilities held, particularly at and around the 'group leader' level. The report on this survey is now under examination by a sub-committee to see how best its findings can be applied; for while it is not difficult to quote figures that might help the case for architects, one has to ensure that the same figures cannot as easily yield a quite opposite conclusion.

(v) Finally, in August 1957 an Assistant Secretary, Miss J. M. N. Milne, who is a statistical economist, joined the R.I.B.A. staff. The immense field of work open to her ranges from an appraisal of the economics of the building industry and of the volume and type of work reaching architects' offices to the more domestic issue of cost control methods. In the intervals of helping with questionnaires and surveys, Miss Milne has been acquainting herself with this range of work.

Her notes on the present outlook in the building industry printed below (which again is something of a precedent) may be depressing, but they are useful. The Ad Hoc Committee believe that an important element in the Institute's leadership should be a thorough grasp of the present and future economic environment, and we think it right that from time to time the knowledge acquired should be distilled in the form of brief, simple and authoritative statements for the benefit of members.

I. Some Thoughts on Professional Status

Introduction

In a newly egalitarian society, it is not surprising that most professions should feel concern about their status. Broadly, what others have gained through the redistribution both of wealth and of social acclaim, the professions have necessarily lost. Accustomed to attending to their responsibilities while a respectful public automatically accords them their 'rights', the professions now find themselves caught between the twin evils of mounting inflation and high personal taxation at a time when other large sectors of society, of newly acquired importance, are showing themselves particularly sensitive to real or imagined grievances, and more than ever clamant in insisting on their 'rights'. Feelings of resentment which before the war would have been concealed by a more authoritarian master/servant relationship in conditions of less than full employment now issue readily in strikes or the threat of of them—actions which the professional man traditionally does not contemplate. Yet from within his own ranks, in all professions, he now hears more strident voices than he was once accustomed to; for conditions of economic stress have goaded many into forthright protest, in defence of standards of living that were once taken for granted.

Yet straight appeals for more money, whoever the spokesmen, are not always a simple expression of a simple need, for they seem often to be voicing also a sense of lost independence and diminished importance and individuality, partly perhaps because the concentration of power and of employment is nowadays often in the hands of large impersonal units. It is, for instance, a relatively new thing for professional men to see their income settled, however satisfactorily, by some remote system of collective bargaining, which to some seems to take too little account of personal merit.

However, these are basic issues which any one profession acting alone cannot do much about. It may be more to the point to consider what are the main ingredients of professional status that are within our control. They seem to be these:—

(1) Prestige, which depends on a high level of individual performance; which in turn depends upon a high quality of entrant; which again depends upon a profession offering sufficient rewards to attract the best material. Since one of the rewards is membership of a respected body of men, this completes the cycle and we are back to quality of performance.

(2) Length and quality of training, leading to a body of specialised knowledge with some practical application, and regulated by a recognised learned society.

(3) Adherence to a code of ethics and a form of discipline prescribed by the regulating body.

(4) A sense of vocation and an element of selfless service, varying in degree from one extreme characterised perhaps by the Church to what, at the other, may be not much more than a rationalisation of quite other motives.

Further, and particularly in Britain, an air of venerable antiquity may be important. Doctors may be respected because nobody

wants to die; lawyers because without them the verbal refinements of their calling cannot be safely interpreted; and clergymen partly in admiration of the good life and partly through suspicion, even in the mind of the unbeliever, that they may be right. But all of them share the common distinction of having been for many hundred years the only literate groups in society (apart from 'gentlemen') who alone held access to the accumulated wisdom of the past and therefore to any intelligent forecast of the future. The coming of universal literacy has upset this, and may be quietly disintegrating the foundations of professionalism laid by the Church, Law and Medicine and built upon by newer professions. Now that everyone has the rudiments of book-learning, new 'professions' with their own examinations and their own regulating societies are multiplying so rapidly that it is becoming increasingly difficult to distinguish the blurred outlines of what is truly a profession from what is not. The word 'profession' is being emasculated through over-use, so that before long the words of W. S. Gilbert may apply: 'When everybody's somebody, nobody's anybody.' Relative values, after a social revolution, will take time to settle down, and it is too early for anyone to dismiss the old-style professionalism as a pleasant and beneficial myth that has had its day and is living on capital; but meanwhile it may do no harm if a healthy scepticism makes one look again at old concepts of gentlemanliness against a new pattern of society.

Standard of Entry

In choosing from these generalisations a few points on which to particularise about the architectural profession, we shall refer to matters which are in the care of specialist committees. This is inevitable, for the components of status are interdependent, cut across all committee boundaries and are the concern equally of all. In drawing a few threads together in this paper, we say nothing that is new or would be unfamiliar to specialist committees, who, we are keenly aware, bring their expert analysis and experience to what we have been concerned only to touch upon.

All will agree that the minimal standard of entry to the profession has advanced some way in recent generations, and that, with the last amendment to the Registration Acts not yet twenty years old, there has been a limit to how fast we could move. It may be that when contemplating the next step, we shall get most help by looking, not backwards, but around us at what others are doing.

Architects would think their qualification equal or superior to any university degree. Yet it is interesting that to embark upon any degree at a British university the minimum standard required is two passes at 'Advanced' level in G.C.E. (often, in effect, three) and about five at 'Ordinary' level; whereas for our Probationership the minimum is five at 'Ordinary' level. The comparison may seem unfair because of the many different routes to a qualification in architecture; but it is worth asking whether an architect can afford to be content with much less than a university type and standard of education. The particular virtue of a university education is said to be the cross-fertilisation of ideas among able and agile young minds of different academic disciplines. If the architect is to hold the balance between art, sociology, economics and technology, does he not stand more to gain from this process than most? But whether or not the universities should have a greater share in architectural training their standards are a yardstick. Their undergraduate numbers in 1939 were 50,000, are now 85,000 and rapidly rising, and for some time have ceased to be the narrow preserve of the rich or the very intellectual. They now represent the normal destination to which any able grammar school boy aspires and is safely shepherded by the Welfare State.

The question arises, therefore, how far a great profession, statutorily responsible for its own education, can afford to have an entry standard below that which a good mind may nowadays be expected to attain. If what is wanted is some ability to draw, artistic leanings and some apparent design potential, the present standard is good enough. If the primary need for the next decade or so is first-class leadership and management potential and a liberally educated outlook, then it is probably not, for though these can exist apart from a reasonable academic competence, they are generally to be found in company with it.

It is an issue which the profession may prefer to face sooner rather than later, for in the next few years it could seize the opportunity to select candidates rather than to accept what material presents itself. This year there are some 645,000 18-year-olds in Britain and though the figure will decline to 611,000 in 1959—the lowest for 70 years—it will then rise annually until by 1965 the numbers will be 920,000. We shall need every artifice to catch our share of this increase, for the Government White Paper of last year on technical education makes it very clear that technology, to be greatly expanded, hopes to absorb the best of it. (It is interesting that though the new Diploma in Technology is meant to attract, among others, the earthy sort who are happier in a workshop than a university, the Government nevertheless envisage a standard of entry much the same as for the universities.) Given that what is hardest to get into so often attracts the best material, we look at the moment to be heading for quantity rather than quality in the coming contest.

One or two things are certain. In all professions, 'the hard way' is rapidly on the way out; we need to devise new forms of practical training to replace it; and the potential genius languishing for lack of formal education is becoming so rare that we need do no more about him than add saving clauses to any legislation, to pick up the occasional man who slips through the series of quite efficient educational sieves.

Practical Training

There cannot be many who would question the importance of practical training, and usually the only major questions at issue are when it should occur and what it should contain. On both counts, the policy of the civil, mechanical and electrical engineers may be worth a glance, since they share our problem of how best to marry practice and theory. They all support the traditional two-year 'post-graduate apprenticeship', countenancing many variations of it and encouraging others, e.g. the Glasgow sandwich course with its alternate six months in a works and six months in college; and, more recently and widely, the 'thick sandwich' course in which a company and a university jointly select a likely candidate, who then does one year's practical in the works, three years in the university, and a final year back in the factory.

As to content, the three institutions prescribe with some precision what the practical training shall contain, and any employer purporting to offer a systematic post-graduate apprenticeship must first have had his course vetted and recognised by the institution concerned if any pupil undergoing it is to get his A.M.I.C.E./Mech. E./E.E.

In our own field, the increasing complexities of construction, the scarcity of skilled craftsmen who can be relied upon to suggest adjustments where needed, the tendency towards narrower margins of safety, and all the factors that make a successful building the result, increasingly, of close team work among specialists, may ultimately drive architects to some closer liaison with building, whether during training or later. Meanwhile it may help if the architect's practical training—which it seems to us should be firmly prescribed and controlled by the R.I.B.A. from earliest Probationership onwards—predisposes him him even more than at present to think in terms of costs, construction and building techniques as he designs. It may be that the supposed shortcomings of architects in these respects account in part for contractors taking them on their permanent staff.

—And Art

In thus putting emphasis on 'base mechanics', we have presumptuously concluded that the present-day architect does not want to be equated with a kind of impecunious sculptor/artist dependent on such aristocratic patrons as may survive; that he has made his peace, in fact, with the marketplace and the Welfare State; that he means what he says about retaining leadership of the building industry; and that he recognises that, whereas to be an architect was once necessarily to be a gentleman and to be a gentleman was necessarily to be thought of as a leader, the new democracy knows no such rules, leadership now being essentially *de facto*, not *de jure*.

It may be thought that too much weight can be given to the practical and the mundane; but we are concerned only to see a proper balance restored. One of the things

that 19th-century sentimentalising has to answer for is a fostering of the dichotomy between art and living; and we are still not wholly rid of the slightly effete delicacy that then surrounded the arts, elevated inspiration so far above technique, and kept the vulgar world at bay. It seems not always to have been so. The 18th-century court musician was commanded to produce a quartet as imperiously as the cook to produce an omelette; and did so about as promptly. Technique came first, whether graced by inspiration or not; and the ultimate in skill lay in creating beauty and artistic variety within the prescribed and potentially restrictive framework of classical form; in accepting the discipline but in being able to say, with Haydn, 'All rules are my obedient and humble servants'.

The profession can afford not to lay heavy stress on art simply because architects are disposed to being artistic. We need to legislate firmly for a few vital things which they are not naturally inclined to, not for what is second nature to them. And in so legislating, we have to forget both the few great innovators who can flout the normal disciplines, and those who bring valuable specialist talents to the job; for they can safely be left to look after themselves and it will only lead us into trouble if we imagine that the majority either are or could be like them.

Research and Higher Degrees

An Associate on qualifying has before him the hope of later becoming a Fellow, which undoubtedly connotes a certain seniority and standard of competence.

It seems, however, that part of the mystique that makes for professional status stems from the more or less elaborate arrangements a profession may have for extending its own boundaries of knowledge. To have several centres at work on fundamental research problems is admirable, but there may be advantages also in individual practitioners contributing by undertaking some solid piece of original research, leading to a specific qualification. This might occur immediately on graduation at a recognised school by transfer to its post-graduate section; or perhaps preferably, on returning there after a few years' practical experience; or by part-time study while earning a living. If it should be found possible to devise one or more higher qualifications to reward such research (with a standing, relative to ordinary members, roughly like the surgeon or other specialist to the medical G.P.) the gains might be these:

(1) It would give the architect a further academic goal to strive for and entail an intangible but real rise in the profession's standing with the public.

(2) It might be an empirical way of moving towards that degree of specialising within the profession which, though some may deplore it, seems bound to come.

(3) It might be possible in time to attract to the teaching staffs of architectural schools a proportion of men who had proved their academic worth in this way. While previous practical experience must be of the greatest importance for the teacher of architecture as it is in engineering, it is interesting that the majority of engineering lecturers at any university will be found also to have a doctorate (as of course will almost all physicists, chemists, biologists, etc.).

Management Studies

We referred earlier to the importance of leadership and efficient management and the hope that the profession may soon have the chance to take this into account in its recruiting. This kind of potentiality, however, is not always easy to identify at age 18 or indeed much later, since people are erratic and variable in their rate of personal development, and many will grow in stature only through exposure to responsibility and opportunity. The question, therefore, is often how best to foster growth once the latent talents have been made to emerge.

Few people would agree together entirely upon a list of qualities that go to make a leader, and one has probably to be content that leadership—and good management, which cannot exist without it—is an amalgam of intangibles that is much easier to recognise than to define. Yet it is now very generally recognised in Britain, as it has long been in the United States, that even if managers are largely born and not made, there are general principles that can be taught, just as there are nowadays specific techniques and bodies of specialist knowledge ('tool' subjects) which a manager can hardly afford to ignore. Thus there are now in Britain a very large number of 'management' courses (geared, perhaps significantly, to manufacturing industry, very little to the building industry) and they are broadly of two kinds. There are those, to be had at every sort of technical college, which aim simply to give instruction in tool subjects such as work-study or cost accounting. The numerically smaller group are those offering advanced and broader courses, often associated with the universities, which aim to expose quite senior men of diverse backgrounds to each other's experience, and, rather than to instruct them, to guide them as to how to study further for themselves.

At the Administrative Staff College, Henley, perhaps the best-known centre for senior courses, Sir Noel Hall has so far had a smaller number of architects than of any other profession that might be expected to be interested. This is not surprising, for the broadest problems of management tend to stem from and be associated with big organisations, and until recently there were few large architects' offices. It would be good to think, however, that from now on the occasional Deputy Architect of, say, a large local authority who will clearly be getting his own 'command' before long, stands a chance of being seconded for such a three-month course, to the ultimate benefit both of architecture and local government.

Secondly, on the more domestic level of quite small private offices, there are various ways of becoming familiar with modern tools of management, without sparing a man for long periods, which may be worth exploring; for while some may feel that the pursuit of slick administration and economical procedures for translating architectural concepts into buildings on the ground is dull stuff, deficiencies here mean lost time, and few know better than architects that time is money.

Finally, one feels it could do nothing but good for the profession and underline its leadership if, wherever architects, quantity surveyors, builders and engineers gather to discuss problems of mutual interest (including, one hopes, local technical college courses) the initiative were primarily to come from the architect.

Prestige

Under this heading we glance briefly at two scarcely related items:—

(*a*) *Fees:* Like much else, this subject is under review by experts. If one imagines a client's advocate present at their discussions, he might claim that it is anomalous for an architect's fees to be based on the final cost of a building rather than the original contract price. Ignoring the influence of professional ethics, he might think that architects have a positive interest in keeping costs up. While he could hardly look for a workable system in which the architect's fees increase proportionately as ingenious savings are achieved, it might be difficult to convince him of the logic of a system whereby an architect's fees could rise for no other reason than that, since the contract was signed, the hourly rate for bricklayers has gone up. Nobody seriously suggests that the present arrangement affects architects' conduct in the least, but if the idea is about that architects are too casual over the spending of other people's money, there may be here a not too costly gesture worth considering to offset it.

Secondly, there is the familiar problem for the client of a proliferation of specialist fees, and the question whether the architect, since he is the leader, can arrange for them to be presented with his own as a consolidated one. This needs no elaborating, beyond noting that one of the attractions about the contractor providing all-in services must be the apparent certainty and simplicity he offers over fees and costs.

(*b*) Most of us would admit to carrying about a mental picture of what other occupations are worth based not on objective assessment but on a series of haphazard and probably superficial impressions. The clarity of this picture of any given profession must depend in part on how sharply its outlines are defined—on who precisely it includes and who it does not. Nobody confuses the dentist with the dental mechanic or the solicitor with his clerk; but among occupations less well placed, the teaching profession suffers from the handicap that 'teacher' is a portmanteau word embracing everybody

from a Winchester housemaster (who might grimace at the title) to the untrained youngster dispensing milk and buns at a village school. Similarly, an 'engineer' may be the Chairman of English Electric or a man who tightens nuts at the garage.

Our own case is helped by a statutory definition of who may call himself an architect, but nothing exists that defines authoritatively how such a man spends his time. If, therefore, the layman should frequently meet A.R.I.B.A.'s who seem to be engaged largely on humdrum routine, who seem closely circumscribed in authority and independence, and who seldom or never design or discuss plans with clients or supervise on site, we cannot prevent his drawing certain conclusions. Clearly The Architect as the client sees him is a very different person.

It could well be that the number of cases in which the coinage is thus debased is negligible, but external evidence is not too encouraging. Great Britain has nearly as many qualified architects as the United States, and probably as high a proportion of architects per head of population as any country in the world. There are many possible implications of this which are worth close study, but logically one feels the most likely explanations ought to be:—

(i) That the volume of building work done in Britain is as great as in U.S.A.; which cannot be true.

or (ii) The proportion of building handled by architects is so much higher in Britain than in U.S.A. that this cancels out the difference in building programmes.

or (iii) Britain must use some of her architects in some significantly different way.

There will be other and better informed opinions about the reasons for the discrepancy, but the practical question needing an answer seems to be this: If, discounting routine work which any qualified man expects to do himself, there remains in architects' offices a surplus of relative hack work, can this be reduced to a level at which it can be comfortably absorbed by young men as part (only) of a prescribed course of practical training to supplement their studies? If it can, there is no problem. If it cannot be so reduced, then someone must do the work; and we have made it clear what we think happens to prestige if whoever does it also bears a respected R.I.B.A. label.

Some may say that too many fully qualified architects are employed in modest capacities because they are not good enough to be used as architects in the thoroughgoing sense. If this is true, no one will need the implications pointed out to him.

Finally, someone has spoken of the Greater Medical Profession, to embrace radiographers, physiotherapists, almoners and other ancillaries of recent growth. Possibly there is something in this concept for us.

Action by Ad Hoc Committee

We have sought to show so far (*a*) that we have aimed to identify the relevant questions rather than to offer categorical answers, (*b*) that an assault during the next decade upon status, if a less straightforward and tangible objective than Registration, may be at least as stimulating, (*c*) that if our themes are thought to have any merits, much of their development is for the able hands of others and not for our Committee to pursue further.

The ways in which the Ad Hoc Committee would hope to contribute are briefly these:—

(i) The preparation of a reasonably full survey of the profession's structure (initially at home, but later overseas); including, for example, differences between A.R.C.U.K.'s Register and our own; annual entry and retirement rates and trends; age structure and educational backgrounds; distribution among kinds of occupation and trends of movement between them; income levels and promotion prospects. The biographical questionnaire sent out to all members last summer was a first move towards this, and further information will be forthcoming from the results of a confidential income inquiry, soon to go out to a 20 per cent sample as part of the R.I.B.A.'s promised collaboration with the Royal Commission on Doctors' and Dentists' Remuneration.

(ii) Much of this information about architects would lack full significance without an appraisal of the work available for them to do. Prominent in our plans, therefore, is a study of the building industry and its economics (again, a comparison with conditions overseas should come later). We need to know the distribution of building work by type, region and class of contractor; proportion of work handled by architects; what they are so far missing—of what kind and, if possible, why and how to know well ahead what projects will soon be afoot.

It is generally agreed, not least by Government departments, that architects' offices provide the most sensitive barometer for measuring what lies ahead for the building industry. It will be important, therefore, to watch trends in the pattern and volume of work reaching architects' offices, so that in time the R.I.B.A. is recognised by the Government as a reliable and valued source of information and advice when policies involving capital investment are being considered.

(iii) A study of the structure, methods of working, fee system and so on of other professions may provide instructive parallels and perhaps suggest some practices that could be usefully borrowed and adapted. Besides the learned, 'regulating' societies, we should want to include successful percussion instruments like the B.M.A.; for though in the end a profession's remuneration must depend on society's estimate of its worth, some judicious moulding of society's thinking seems legitimate enough.

(iv) There are a dozen reasons, however, why one cannot simply create a parallel pressure group for architects and expect it to achieve what the B.M.A. is said to achieve. The more we study the question of an architects' union, the less it seems to provide the answer to what the profession is seeking. To create an effective union, as distinct from an emotional rallying-point, would take much time, patience and manœuvring and we should expect it to be a matter of years before it could be profitably tried—if only because the profession needs first to reach a stronger position *vis-à-vis* the public and competitors. Whether the case for launching one will then be self-evident, we cannot see far enough ahead to know.

Meanwhile, the Ad Hoc and Salaried and Official Architects' Committees can develop a still closer understanding with existing unions, and join with other professions in seeking to get the representation of professional men on a better footing. It is too early to say how much current attempts to do this in the field of local government will achieve, but a success here might encourage the major professions to unite to some purpose on broader issues. In an age of giant pressure groups, one that speaks for all major professions seems more likely to be heard than yet another sectional society.

(v) The more the R.I.B.A. knows about its members' circumstances and the organisation and staffing of offices, the better its chances of bringing influence to bear both on unions and on those in the public service responsible for applying salary scales once they are settled. It is partly because of this that we shall hope to make further studies of architects' offices (of which the recent survey of some county offices is an early sample). A no less important reason for doing so, we believe, is that the R.I.B.A. should thereby become the recognised repository of information and experience on office structure, methods and staffing. It would thus be equipped to advise on the setting up of new departments; where this or that method has proved particularly successful, spread news of it among members; and in time perhaps evolve some principles of organisation that could be recommended for different types and sizes of office. Necessarily, we are wholly dependent upon the ready co-operation of members if the facts are to be forthcoming.

Inevitably we should learn a good deal about salary levels and the responsibilities that go with them. This could lead the R.I.B.A. into a dilemma which may as well be candidly faced. It is one thing to bring general pressure to bear on public authorities to pay good salaries, in the interests of raising the general level of remuneration for the profession. It is another to argue a closely reasoned case, based on solid data, to show that a given kind of architect having a given responsibility should receive a specific salary. For if in this way the R.I.B.A. sets itself up as arbiter of what is right and fair in the public field, it is left with no option but to apply the principles within the profession. If, indeed, the R.I.B.A. decides that assistants in general have economic interests with whose protection it ought to be concerned, it seems bound sooner or later to write into the Code of Professional Conduct something, however generalised, to set some minimal standard in private practice. The Institute's

decision on this, if not a prerequisite for the making of any detailed case externally, is intimately bound up with it.

(vi) Since industrial building must be a source of new work not yet fully tapped, it will be worth attempting to compile a dossier of successful industrial building by architects with supporting facts and figures of a kind likely to carry weight in the board-room. It may be that parallel with this dossier and with any use made of it, the profession generally will need to develop a firmer command of the technology of factory design.

(vii) Though the appointment of architects as chief officers in local authorities is at present more directly within the purview of the Salaried and Official Architects' Committee, we aim to become acquainted with the domestic circumstances of those authorities which have no chief officer but might be persuaded to appoint one, so that the most relevant arguments can be selected when making a case.

(viii) We should hope to be available as a 'service station' to other committees where they may feel in need of more precise data. It may be, for instance, that an attempt to meet the challenge of the all-in service could most profitably begin with a hunt for reasonably comprehensive facts.

This list of activities is neither exhaustive nor a chronological programme, for a variety of expediencies and pressures may need to be admitted in determining their order. While one or two are projects with a predictable start and finish, most, once initiated, will need deep consolidation and steady maintenance over the years to give the R.I.B.A. the authority in these fields that we are anxious it should have.

In laying emphasis on verified facts, we undertake not to be mesmerised by them. They are seldom if ever a substitute for judgment, for when all is known one is usually left with the same issue to decide, But they can prevent wrong decisions by revealing what was unknown or imperfectly realised, and they form a sound basis for discussions which, without them, might be woolly and discursive.

II. Future Prospects in the Building Industry

IT IS NOW POSSIBLE to see what is likely to be the effect on the building industry, and on the flow of work into architects' offices, of the Government's measures announced on 20 September 1957 (*a*) to hold the total of public investment during the next two years at the 1957–58 level and (*b*) to discourage private investment by (1) raising the Bank Rate, (2) keeping down the level of bank advances, and (3) stricter control by the Capital Issues Committee.

Before this announcement, it had been expected that the level of building output in 1958 would show little change over 1957, increases in the public sector (excluding housing) offsetting likely reductions in housing, private industrial building and other private work. Now, there is likely to be an even sharper drop in housing and industrial building with no compensating rise in public investment. (Indeed the fixing of the latter at the 1957 level in money terms may well mean a cut in real terms unless increases in building costs are avoided.)

In the public sector, the Chancellor has announced that the following programmes, all involving the building industry to a greater or lesser extent, will be affected:

(*a*) *Local authority house building* will be progressively slowed down so that by 1959–60 it will be about 80 per cent of the 1957–58 level, equivalent to about 120,000 houses.

(*b*) *The nuclear power programme* will be spread over a longer period; over the next two years total spending on power—coal, gas and electricity—will be 10 per cent less than previously forecast.

(*c*) *Post Office investment* which has been rising towards £100 million a year will be reduced by 5 per cent in 1958–59 and a further 5 per cent the year after.

(*d*) *The railway modernisation programme* will be slowed down.

The main school building programme and the programme for technological education will not be cut, although minor improvement projects will be restricted. The road programme will not be cut.

In the private sector expenditure on new housing is likely to suffer from the higher interest rates and the difficulty which would-be house purchasers may have in raising a loan or the necessary cash deposit. Many local authorities have restricted—and a few have stopped—loans for house purchase. Although in general building society interest rates for borrowers have not been increased as yet, the supply of money for lending is not sufficient to meet the demand. The value of building work on houses for private owners was £240 million in 1956, about 40 per cent of the total on housing, local authority housing accounting for some £380 million; in 1957 private house building increased its share of the total.

Private industrial building appears to have reached its peak in the early part of 1957 and total output in 1957 is likely to be at least 5 per cent below the level of 1956 when the increased cost of building is taken into account. This downward trend reflects the results of the previous round of credit restrictions in the spring of 1956, which have necessarily taken some time to work their way through the building 'pipeline'. Indications were that manufacturers' spending on new building work in 1958 would continue to fall even before the current restrictions. The latter will no doubt serve as a further discouragement, and will also affect new commercial building.

It may help to set out some of the factors which seem likely to affect the architectural profession if Bank Rate is kept at a high level for a long period as seems possible (although these are probably all-too-well known to architects from earlier 'credit squeezes').

(i) The architect will be the first to notice any slackening of new building projects which would-be clients have decided to defer.

(ii) On the other hand, clients may decide to get their initial planning and design prepared in advance, in order to be ready to go ahead as soon as Bank Rate comes down. This is particularly true of local authority schemes, although it may also apply, for instance, to a commercial client who owns land ready for development.

(iii) Local authority work which might have been given out to private practice will probably be done within the department.

(iv) With the existing difficulty of recruiting good assistants, both local authorities and private practices will try to retain their existing staffs wherever possible. The smaller practices, however, with more limited resources, may well find this difficult after a time.

(v) The outflow from the architectural schools over the next two or three years will continue regardless of current events, and there may be temporary difficulty in absorbing all the architects who qualify in 1958.

The individual architect will make his own assessment of the position in the light of factors such as the above in relation to his own circumstances—whether he is working in a public or private office, the size and location of the office and the types and variety of work handled, etc. To show the relative importance of the various types of work the following table gives an indication of the output in Great Britain of new building work in 1956 (including an estimate for new work done by labour employed by public authorities):

	For Private Owners	For Public Authorities
	£ million	£ million
Housing	240	380
Industrial building	270	385
Other new building	160	
Total new building work	670	765

Of the £160 million spent on other work for private owners it is estimated that something like 30 per cent was spent on office building, about another 20 per cent on new shops and large conversion schemes: the rest of the money was divided among a large variety of activities including places of entertainment, garages, hotels, etc., and something like 5 per cent was spent on the construction of new churches and the rebuilding of churches destroyed through the war. The final figures for 1957 are expected to show a slight increase in the total value of new building work, with minor variations in the distribution of work between public and private owners.

Practice Notes

Edited by Charles Woodward[*A*]

MINISTRY OF HOUSING AND LOCAL GOVERNMENT. Housing Accommodation for Old People. Circular 55/57 addressed to housing authorities in England and Wales stresses the need for making adequate provision, within their revised programmes, for the housing of old people.

The provision of one-bedroom dwellings both in new and converted properties will make it possible for houses at present occupied by old people to be released for occupation by larger families, while at the same time providing more conveniently for the old people themselves. Some old people affected by the Rent Act may have, within the next twelve months, to find accommodation better suited to their means. Some may need help and may well look to the local authority for it. The Minister is sure that all authorities will do their best to give assistance in one form or another.

The Minister hopes that local authorities will provide in their revised programmes for the building of as many one-bedroom dwellings as possible. They should also consider the possibility of acquiring and converting suitable existing properties, with the aid of conversion grant, into accommodation for old people.

In future, conversion schemes which are otherwise satisfactory will not be excluded from grant because they provide for some sharing of kitchen facilities. In such cases not less than one sink and cooker should be provided for every two persons, and each person should have a ventilated storage cupboard of adequate size.

Local authorities, by making available grants and loans, can encourage the carrying out of conversion schemes by private owners. In the same way, they can also assist the work of housing associations undertaking the housing of old people in their area.

Loan sanction will be available where local authorities are willing to purchase by agreement any suitable larger houses belonging to old people who would like to become tenants of small council houses. The larger houses can then be used to house families off the waiting lists. Local authorities can also help to ensure that existing accommodation is used to the best advantage if they will make arrangements for facilitating transfers between private lettings and council houses.

REPORT OF THE COMMITTEE ON BUILDING LEGISLATION IN SCOTLAND. The Committee has issued its report which is obtainable at H.M.S.O., price 5*s.* 6*d.* Some of the Committee's findings are as follows:

Building Control in Scotland lacks uniformity. A new building Act, and regulations to be made under it, should replace present building laws.

Existing authorities should continue to administer building laws, but their power should be limited to requiring compliance with a new national building code. Detailed building requirements should be laid down in regulations made by the Secretary of State.

The new regulations should not specify exact requirements of thicknesses of material or size of windows, etc. They should require certain standards of performance. Architects and manufacturers would thus have more flexibility in design.

The new regulations should deal with preparation of sites; strength and stability; structural fire precautions including means of escape; resistance to moisture; resistance to the transmission of heat and sound; durability; resistance to infestation; drainage; ventilation; daylighting; heating and artificial lighting; access and prevention of danger and obstruction.

Building control must have as its first objectives safety and the protection of health. Standards should not be set wastefully high. The law of building should be capable of dealing with all structures except those which are inappropriate for building control such as road and street works, bridges over public highways, sewers, water mains, and other such services. Aerodromes would also be excepted.

The regulations should exempt from building control such erections as industrial plant, civil engineering works and buildings erected by statutory undertakers, but a suitably modified code should apply in such cases. Modifying control over buildings designed by persons with professional qualifications was considered but was not recommended. It is, however, recommended that the Building Act should prescribe the qualifications required of persons appointed to advise a building control body. Such qualifications would be prescribed by regulations made by the Secretary of State after consultation with the appropriate bodies.

Regulations are recommended in preference to bye-laws. They enable detailed requirements to be excluded from statutes and allow flexibility and relaxations. 'Deemed-to-satisfy' clauses should be retained, but other methods of satisfying performance standards should not be precluded.

It is not the function of building control to protect an owner against the builder; that is a matter of contract.

The siting of a building is a matter for planning control as is also amenity.

Housing standards should continue to be laid down.

Moveable buildings, as defined by regulations, should be exempt from building control.

Regulations should distinguish between requirements for new buildings and those for existing buildings.

Change of use of a building should require an application for consent. Higher building standards may be required for some uses. An applicant should be heard by the committee dealing with the application, the public should be allowed to attend the proceedings and the committee should give their decision in public with reasons for any decision to reject the application.

If building proposals do not contravene the building regulations, the controlling body should be obliged to give permission. A right of appeal against decisions should be open to an applicant either on technical or legal grounds.

The Secretary of State should be advised by a committee in respect of relaxation of building controls, and typical relaxations should be published from time to time. There should be a limit to the power to make relaxations.

No new building should be occupied until there is a certificate of completion from the controlling body. A certificate should not be given unless there is also a certificate in respect of electrical work complying with the required standards.

Building regulations should prescribe a form which should state clearly such other authorities whose permission might be needed. Overlapping and conflicting requirements should be eliminated as far as possible.

Appendix 1 contains a paper on the jurisdiction of the Dean of Guild Courts.

Appendix 2 gives a list of public general Acts affected by the committee's recommendations.

Appendix 3 gives a list of organisations who gave evidence together with the views expressed in answer to a questionnaire.

THE NATIONAL BUILDINGS RECORD

The Annual Report of the RECORD for the year 1956–1957 has now been issued.

In the work of ensuring that photographs and, where desirable, measured drawings should be made of buildings threatened with demolition, full help is given by the Advisory Committee to the Minister of Housing and Local Government, who notify the RECORD of each case. Through the same Committee co-operation is established with a great number of local planning authorities, many of whom supply the RECORD with records of threatened buildings in their areas. The success of recent legislation concerned with the preservation and (where loss is inevitable) the proper record of historic buildings, may largely depend on the attitude of local authorities.

The Report for 1956 of the Historic

Buildings Council for England deplores the lack of co-operation on the part of some local authorities, and the cases that slip through gaps in the planning machinery occur most frequently from lack of realisation of their responsibilities by a few and from a certain hostility from others.

Another defect in the existing powers, which is more difficult to remedy, is that even when a Preservation Order has been issued, the owner has no obligation to prevent disintegration by decay.

The RECORD's collection contains 480,000 items and negatives of photographs to the number of over 300,000 are available to applicants for copies. The address of the National Buildings Record is 31 Chester Terrace, Regent's Park, London, N.W.1. Telephone: Welbeck 0619.

WAR DAMAGE COMMISSION AND CENTRAL LAND BOARD. The South-Western Regional Office of the War Damage Commission and Central Land Board, 19–21 Woodland Road, Bristol, 8, which covered Gloucestershire, Wiltshire, Somersetshire, Devonshire, Cornwall and the Scilly Isles, has been closed.

Its remaining war damage work has been transferred to the War Damage Commission, Government Building, Bromyard Avenue, Acton, London, W.3, and its Central Land Board work to the Central Land Board, 246 Stockwell Road, Brixton, London, S.W.9. War Damage Technical Centres will, however, be maintained at Bristol, Plymouth and Exeter.

The North-Western Regional Office of the War Damage Commission and Central Land Board, Government Building, Burton Road, West Didsbury, Manchester, 20, which covered Cheshire, Lancashire, Westmorland and Cumberland, has been closed.

The war damage work of the office (except that connected with churches) has been transferred to the War Damage Commission, Government Building, Bromyard Avenue, Acton, London, W.3. The work related to churches has been transferred to the Commission's office at City Gate House, Finsbury Square, London, E.C.2. War damage technical centres will, however, be maintained at Manchester, and at Eagle House, 57 Dale Street, Liverpool. Central Land Board work has been transferred to the Central Land Board, 246 Stockwell Road, Brixton, London, S.W.9.

The Manager's office of the War Damage Commission, Magnet House, Kingsway, Cardiff, has been closed and correspondence should now be addressed to the Manager, War Damage Commission, Government Building, Bromyard Avenue, Acton, London, W.3. War Damage Technical Centres will, however, be maintained at Magnet House, Kingsway, Cardiff, and at 24 Worcester Place, Swansea.

LAW CASE. R. B. Burden Ltd. v. Swansea Corporation. House of Lords. March 1957. R.I.B.A. Form of Contract, Clause 20. Whether building owner interfered with or obstructed the issue of an interim certificate.

In this case the contractors determined their employment under Clause 20 of the contract on the ground that the Corporation had interfered with or obstructed the issue of an interim certificate. The hearing before an Official Referee lasted for fifty-three days and he upheld the contention of the contractors. The Corporation appealed to the Court of Appeal who held that the Official Referee was wrong and allowed the appeal. The contractors then appealed to the House of Lords who, by a majority, dismissed the appeal.

The facts of the case are not of interest, but their Lordships' interpretation of the R.I.B.A. Contract is important.

In relation to the architect under the contract the House of Lords said that his general function is to act on behalf of the owner, and he is the owner's agent to give the required instructions to the contractor. But in those parts of his duties which relate to the giving of certificates for payment he stands apart from the owner and enjoys to some extent an independent authority of his own. The terms of the contract itself involve that he should have an irrevocable authority from the employer to issue certificates for payment to the contractor up to the amount and according to the terms which the contract prescribes. Under this contract, if the employer even attempts to prevent him doing so by interfering with, or obstructing, their issue, the contractors are entitled to call off the whole transaction by summary notice; and when the contract goes the architect's authority goes with it. This power of determination is a clear recognition of the fact that in matters of certification the architect is not simply the agent of the employer but has duties of his own to perform under the contract, duties which he assumes by accepting his appointment as architect.

It is an established principle of law that, in granting a final certificate under a building contract, the architect acts in an arbitral capacity and is not merely in the position of an agent for the building owner. The effect of that is that, in granting his certificate, the architect has a duty towards each party to hold the scales evenly. The considerations which give him this arbitral position with regard to a final certificate are not necessarily applicable so as to place him in the same position with regard to each interim certificate, but for the purpose of this case there is not any need to decide that point, except to say that under the contract the architect is treated for some purposes as a person distinct from the employer and that, in the exercise of his right and duty to issue interim certificates for payment, he is so far distinct that any act of the employer which interferes with, or obstructs him in, that duty is a breach of contract which goes to the root of the whole engagement.

The duties and position of the surveyor do not appear clearly from the terms of the contract. He is appointed by the employer in the first place and, if the post falls vacant, it is the employer who names his successor. No doubt he is to be paid by the employer. The only specific references to him in the conditions are in Clause 9, where he is given the duty of measuring and valuing all variations sanctioned by the architect, and in Clause 22 in respect of expenses of the contractor in special packing of which the architect informs him. Generally speaking, the surveyor is the person charged with the duty of valuing the contractor's work and advising the architect as to the allowance of his claims for payment, interim and final. But there is not anything in the contract which suggests that the architect is bound to accept the surveyor's opinions or valuations when he exercises his own function of certifying sums for payment. At that point the architect remains master in his own field.

The acts of the employer which could amount to obstruction or interference under Clause 20 would be refusing to allow the architect to go on the site for the purpose of giving his certificate, or directing the architect as to the amount for which he is to give his certificate or as to the decision at which he should arrive on some matter within the sphere of his independent duty. Negligence or errors or omissions by someone who, at the request, or with the consent, of the architect, is appointed to assist him in arriving at the correct figure to insert in his certificate cannot amount to interference. Interference connotes intermeddling with something which is not one's business. Errors due to negligence were never intended to give rise to the remedy afforded to the contractor by Clause 20, but fall to be dealt with only by arbitration under Clause 27. (*All England Law Reports*, 1957. Vol. 3, part 5, page 243.)

[**Note.** In giving the dissenting judgment His Lordship hoped that those concerned with the drafting of the printed form of contract may be led to try to substitute words which will indicate with less obscurity to the contractor when he is entitled to exercise the rights conferred by Clause 20.]

The Future of the Nash Terraces

A STATEMENT on the Future of the Regent's Park Terraces was published by the Crown Estate Commissioners at the end of November,[1] and the Chairman, Sir Malcolm Trustram Eve, held a Press conference.

The problem of what to do about the Nash Terraces has existed at least since 1946, when a Government Committee under Lord Gorell considered their future.[2]

Accepting the unique character of the Nash Terraces, the Commissioners say in their report that clearly the 374 houses in the 22 terraces around the park or forming its entrances cannot be left in their present state to decay; nor can they be demolished merely in order to erect modern replicas; not could they all be restored to effective use if the cost were to be anything like

[1] H.M.S.O., price 9*d*.

[2] Report of the Committee on the Regent's Park Terraces. Cmd. 7094. H.M.S.O., price 1*s*. The R.I.B.A. submitted a report and gave evidence before the Gorell Committee after the Town and Country Planning Committee had studied the problem. In general the Gorell Committee agreed with the R.I.B.A. recommendations.

£8–£10 million—the present equivalent of the estimate put before the Gorell Committee.

The idea was considered, but not accepted at this stage, of holding a national competition for a master plan for new buildings surrounding Regent's Park, for the purposes of comparison in appearance and cost with the Terraces converted to modern use.

The Commissioners have decided to concentrate entirely on the possible methods of preserving by conversion for effective use. They will welcome offers from experienced developers to undertake large-scale conversions of terrace buildings into modern flats and maisonettes. If these are successful all the buildings facing Regent's Park will be kept for residences, but parts of the buildings not facing the Park may be used for non-residential purposes.

At this stage no grant is being asked for from the Government, and efforts will be made to see whether the Terraces can be restored without a large subsidy.

The structural condition of the Terraces was the biggest problem. Most of the buildings are considered to have come to the end of their normal life. Before it would be justifiable to spend money on extensive modernisation, in order to let them on lease for a further period, it would be necessary to carry out an extensive survey of the old structures.

None of the walls has concrete foundations or d.p.c.s., and the brick footings of the main walls are built direct on the clay at a depth of not more than a foot or two below basement floors. The brickwork, says the report, is generally of poor quality, lacking proper bond, and is laced with old timbers which are a source of potential weakness.

As a general rule, additional and different loads could not be imposed on the existing walls. The stuccoed façades require frequent painting, and a substantial part of the plumbing and drainage, etc., need redesigning.

Until the structure of each terrace has been exposed and examined it is not possible to establish the extent of work that would be necessary to ensure a further expectation of life of 60 years.

The following decisions have been taken by the Commissioners.

To preserve and rebuild, where damaged, Park Crescent, Park Square East and West, and York Gate. These comprise 61 houses. Leases will be granted or extended and it is hoped that restorations can be carried out without any subsidy.

To retain Hanover Terrace and Kent Terrace in their entirety as houses or maisonettes. These 38 houses are thought to have a further 'economic life' of at least 20 years, and the Commissioners will therefore offer to grant or extend leases for about that period in return for the carrying out of improvements or payment of increased rents.

Cumberland Terrace (33 houses) is to be converted within its present main walls into modern flats by the Commissioners at their own cost, as they think it is vital to obtain practical experience of the actual cost of a large sample.

Mr. Louis de Soissons, C.V.O., O.B.E., R.A. [*F*], has been appointed architect for the work which is estimated to cost in the region of £650,000 and will include a block of single rooms and two-roomed flats with garages below to be built on the mews property behind the terraces.

Cambridge Gate, built in 1876 and of no architectural merit, is to come down, as is also the adjoining building known as Someries House.

The Commissioners propose to choose 'a skilled developer, advised by an architect acceptable' to them, to develop the sites in harmony with the surrounding Nash buildings.

The remaining terraces, which include Sussex Place, Cornwall, York and Chester Terraces, with nine smaller terraces totalling 221 houses, are available for conversion into first-class residential accommodation on a commercial basis.

The Commissioners are anxious to receive proposals from experienced developers with the proviso that their architects must be acceptable to the Commissioners.

The report says that the most practical scheme would seem to lie in lateral conversion of several houses into flats and maisonettes. It is estimated at present prices that to convert 50 houses would cost £1 million, and that rents would not be likely to provide even a moderate return on more than half this expenditure, even if the value of the land is disregarded.

These decisions have the support of the Royal Fine Art Commission, which has offered to advise on any new building to be erected in place of Cambridge Gate and Someries House, and has asked to be consulted at an early stage on any proposals for the treatment of those terraces which are to be retained.

Book Reviews

The Modern Architectural Model, by *T. W. Hendrick*. 8¾ in. 144 pp. incl. illus. Architectural Press. 1957. 16*s*.

One cannot avoid a cliché when describing this book as the model maker's *vade mecum*. Although primarily a text-book for those engaged in this work, the almost universal fascination of the miniature will commend it to many who are not actively employed in model making.

Models, as the author points out, fulfil two purposes: experiment and explanation. While the latter is more usually accepted as their main function, small experimental constructions of wood, wire and plastics are widely used in the training of architectural students, wherever the influence of the Bauhaus is found. Indeed, one can hardly overemphasise the value of model making of this kind in ridding the architectural student, at the beginning of his training, of any preconceived ideas he may have on designing 'from the outside inwards', when he is required actually to organise space in wood, wire, cardboard and perspex.

Many architects, of course, now use open experimental constructions in the early stages of design, and the use of models of this kind is an important addition to two-dimensional drawing board designing. For this reason *The Modern Architectural Model* will be of use to those who are not professional model makers, although the latter will find in it a great deal of information about new methods and materials.

The whole field of model making is covered; studio and workshop equipment, materials and their uses, scale and presentation, interiors, contours and landscape, as well as exhibitions stands, dioramas, cycloramas, perspective models, lighting, and so on. Title plates, show cases and packing for dispatch are also dealt with, and even a list of suppliers of materials and tools is given.

The book is well indexed, pleasantly printed, and very fully illustrated with photographs and explanatory drawings, while the text is sensible, straightforward and factual. Sir Hugh Casson has written a foreword. J. L.

Applied Building Construction, by *Anthony Medlycott*. 10½ in. 136 pp. incl. illus. Chapman and Hall. 1957. £1 5*s*.

An author who sets out to write a new book on building construction may well feel conscious of a little temerity in treading so well-worn a path, but Mr. Medlycott's experience in teaching architecture and building has convinced him that there is room for a book for students, published in one-book-a-year form, wherein the methods of construction given are closely related to application on the site. The volume under review is a first-year course.

The author has not confined himself to mere factual descriptions of building techniques, but frequently gives little explanatory asides, as it were, which should help the student to grasp the whys and wherefores. The illustrations are of what the author calls 'architects' tablecloth' variety, but they are none the less clear and helpful for that. The chapters into which the book is divided are each headed with a glossary and ended with a bibliography and brief notes on materials. The reader's mind is not overloaded with descriptions of everything; for instance, in the chapter on plumbing and drainage the author writes, 'Waste stack pipes may be of cast iron, copper, lead or asbestos cement, but only cast iron pipes are dealt with here, being most generally used.' The results of recent research find their place in the book, such as the effect on flues of slow-burning heating appliances.

In some cases it would not perhaps be possible to write dogmatically and not leave the student with a feeling of uncertainty; for instance, in the note on materials —at the end of the chapter on ground floors—the author writes, 'Wood should be kiln-dried to a moisture content compatible with the building (taking into account central heating).' This may lead the student-reader to wonder what would be a compatible moisture content, but the statement at least puts the matter into his mind.

A note printed on the dust cover states that the non-student layman, do-it-yourself craftsman and many others will find that this book provides much useful information about building techniques; it does, and subsequent volumes will be awaited with interest. F. W.

Private Architectural Practice, by *Maurice E. Taylor*. 8 in. 118 pp., illus. Leonard Hill. 1956. 15*s*.

'Architecture is not merely an art but, as any private practitioner will tell you, is a highly skilled business. "Where can we learn the business side of architecture?" appears to be the cry of assistants who would be private practitioners.'—Thus the author's preface: the succeeding 23 short chapters, many of which appeared as occasional pieces in the ARCHITECT AND BUILDING NEWS attempt to provide an answer. As magazine articles these were not without interest, but putting them together has not made a text-book and, in fact, Mr. Taylor disclaims having written one, describing the chapters as 'gleanings from personal experience'.

A better description would be a discursive guide, an architectural 'how to win friends and influence people', with advice on the way to advertise legitimately without overstepping the code of professional conduct, and with warnings against committing such *faux pas* as presenting a gold watch at an official opening.

The illustrations are poor, and that of the 'necessary equipment in daily use' with adjoining key (1. Diploma, 2. T Square, 3. Six foot measuring rod, 4 . . .), one hopes is humorously intended, particularly as the diploma is hanging crookedly. The examples of the sort of drawings to show clients I cannot believe are really suitable for that purpose, and as specimens for emulation perhaps reflect the same attitude as that woeful 'architecture is not *merely* an art'.

It is to be regretted that the title gives a misleading impression of the content, and that the author has not felt it worth while to reconsider these essays before putting them into book form, to order more carefully all his valuable professional experiences and reflections (not only on the business side of practice), and to produce a short, serious, well-written text-book that could be truly called 'private architectural practice'.

TREVOR DANNATT [*A*]

Form in Gothic, by *Wilhelm Worringer*. 8¾ in. xv + 181 pp. incl. illus. Tiranti. 1957. 25*s*.

Form in Gothic is the title of the English translation of an early work by a distinguished scholar of the universities of Bonn, Königsberg and Halle—Wilhelm Worringer. It was written almost fifty years ago in the era of intellectual ferment which preceded the First World War: indeed, both the youthfulness of the author and the ethos of the time are reflected in the fervent writing and the magnitude of the question which he chooses to examine—the nature of Gothic art.

Dissatisfied with critical methods which fail to 'explain the ordered relation between the inner sentiment of Gothic and the outward form of its expression in art', Worringer suggests an approach which aims at 'a psychological interpretation of style'. In the development of his argument he attempts a description of the essential nature and origins of the Gothic creative spirit, and maintains that its earliest manifestation is to be found in the 'early northern ornament' which had already appeared in the Hallstadt and La Tène period: it is this same sensibility which later finds mature expression in the cathedrals of the 12th and 13th centuries, and which breaks through again in the 'strange garb' of the northern baroque.

This is a broad and stimulating concept, but not all of Worringer's supporting arguments can be accepted without question. For example, his briefly expressed opinion that English 13th-century architecture is but 'tinged with Gothic', can only be looked upon as a facile elimination of an obstacle to the development of his thesis: moreover, he clearly underestimates the importance of the 12th-century French cathedrals in his determination to show that the purest architectural expression of Gothic sensibility is to be found in Germany. Nevertheless, this is a vigorous essay developed with ordered and sometimes brilliant reasoning, and must still be regarded as an important contribution to the literature of Gothic art.

B. G. MORGAN [*A*]

Gothic Cathedrals and Sacred Geometry, by *George Lesser*. 2 vols. 10 in. 166 pp. + 54 plates. Tiranti. 1957. £3 3*s*. the set.

The Gothic cathedral is the ultimate glory of the stone and brick skeleton building in Europe. Its design and structural principles and their symbolic interpretation were kept as closely guarded secrets by the masonic lodges, and passed on from generation to generation of the privileged few. After five years' apprenticeship and one year's travel, initiates had to undergo two more years' training before they became Master Masons and, as such, guardians of the mathematical lore in the lodges, which were to all intents and purposes religious fraternities. Hardly anything was written down, and more imagination than method or analysis has been used in the many attempts to discover their secrets.

This new work makes exciting, although not always easy, reading. It is thorough and learned, and I despair of doing it justice in this necessarily brief review. 'Ecclesia materialis significat Ecclesiam spiritualem.' Geometry, symbolism, magic and history! I sometimes wondered whether this book had been written by an architect, a mathematician, an historian or a fiction writer.

The author endeavours to fit a comprehensive system of abstract symbolic geometry into the pattern of his subject-matter, which comprises six circular or polygonal buildings from Roman temples to romanesque churches, 18 North German brick churches of the 13th to 15th century, the so-called Baltic Group, and the great fabrics of Amiens, Rheims and Westminster Abbey. Plans, sections and elevations are illustrated in 38 multi-coloured plates with abstract diagrams superimposed.

The basic elements of this sacred geometry are 'triangulum' or 'quadratum.' Both are applied to centralized as well as longitudinal churches, but predominantly the square, octagon and octagram are shown to be at the root of the Gothic architect's technique of design and train of thought. A few combinations of these elements provide typical diagrams which the author offers as a product of his analyses. Mr. Lesser claims credit for his novel theories, by reason of their fundamental consistency when applied to a number of individual creations as far apart as Eastern Germany, France and England, and also because of the surprising, yet plausible, symbolic interpretations to which those diagrams lend themselves.

The presentation of the whole work by the publisher is of a high standard.

R. HERZ [*F*]

The English Cathedral through the Centuries, by *G. H. Cook*. 8¾ in. 384 pp. incl. 28 illus. + [98] pls. and pp. of illus. Phoenix House. 1957. £2 5*s*.

The author, who has already produced books on chantries (1947) and parish churches (1954), as well as several cathedral monographs, now gives us another work of careful scholarship, packed with facts and references and therefore inevitably rather heavy reading. The general scheme is first an historical review of foundations (Saxon onwards), then studies of plan and outstanding architectural features, and lastly a chronological survey of architectural periods to the present day; useful chapters on interior arrangement and on precincts and their buildings (though without plans) intervene. Individual cathedrals are separately analysed under their various periods. There are tabular appendices on chantries, tombs, and length dimensions, also a short bibliography and a good index; in this and in the text figure numbers are given, as too often, without their pages.

The illustrations, nearly 150 of them, are comprehensive within limits: the text plans are very useful, though they have no scales or north-points and their hatching is sometimes obscured by reduction; those of the Saxon cathedrals and the crypts are the most valuable, because elsewhere scattered, features; the reconstructed Norman plans are also illuminating. The photographs are excellent and well chosen, roughly about three per building; dates in the captions (an oft-uttered plea) would be valuable. The inclusion of 19th- and 20th-century cathedrals, with illustrations and a few with plans, is especially useful.

Altogether the work is a basic textbook for those concerned with the deeper questions of these national treasures, and would be a suitable presentation volume for more serious students.

H. V. M. R.

Medieval religious houses: Scotland. With an appendix on the houses in the Isle of Man, by *D. E. Easson*. Maps by *R. Neville Hadcock*. 8¾ in. xxxvi + 204 pp. + (3) folding maps. Longmans, Green. 1957. £2 5*s*.

Following Gasquet's *English monastic life* (1904), with its single alphabetical list, and H. Ernest Roberts's *Medieval monasteries and minsters* (1919), listing by Orders but not together, David Knowles and R. N. Hadcock's *Medieval religious houses: England and Wales* (1953) carried the study much further, with carefully-sifted documentary citations; it gave also indications of architectural survivals, whether in the care of the Ministry of Works or religious bodies or otherwise; it listed houses by Orders but gave also an index of all of them. This Scotland volume follows the same principles; the author is different, but that of the earlier work writes a foreword, and the maps are by the same hand, following the Ordnance Survey's *Monastic Britain*. It still marshals only documentary, i.e. institutional, evidence, but lays a foundation for collation with the architectural testimony where buildings survive.

There are said to be eight times as many foundations in England and Wales as in Scotland, which accounts for the rather slenderer volume. Surviving Celtic foundations are here an ancient heritage; one Order—the Valliscaulians, from France—appears only in Scotland; on the other hand the Grandmontines, the Bridgettines and the Bonshommes occur only in the south. Throughout the book the main list at the top of the page has documentary information in smaller type below it taking up most of the space.

Typographically, in this volume as in the other, confusion is caused by repeating the heading for the Order at the top of each page as if it started there; the italicized top-title could have been partly used for this. In the Contents the general categories are better grouped than in the England volume. There are three maps showing distribution but no other illustrations except on the jacket, which is deceiving. H. V. M. R.

The Cathedrals of Spain, by *John Harvey*. 9 in. 280 pp. incl. illus. + front. + 93 pls. Batsford. 1957. £1 15*s*.

New ventures are always exciting, and invariably welcome. This alone, apart from any other merit, makes John Harvey's *The Cathedrals of Spain*—which is virtually the first book in English to assess and relate these magnificent cathedrals as a subject in themselves—as essential a part of a basic study on Spain as Bevan's classic *History of Spanish Architecture*.

Spanish culture and architecture are enormously difficult subjects for any author to write about. The well-known saying of Lamperez that 'The art of Spain is alluvial' has never been bettered for its terse imagery of how wave after wave of foreign religion and influence drifted on to Spanish soil, deposited various ideas and structures, and receded before yet another incoming influence. All this extraordinarily complicated intermingling and overlapping makes the task of any author—and reader—doubly hard without recourse to some sort of brief chronological diagram as in Bevan's work. This, if present here, would have clarified the different trends of development in Mr. Harvey's book.

Mr. Harvey seeks to show that, although all these influences can be isolated, there yet remains an essentially Spanish essence, a quality which unifies all the ebbing and flowing of successive styles in the great cathedrals into a singular national character—although it is open to doubt if this unity extends as far as that horrible offender, the Christian Cathedral of Cordoba, which was literally grafted into the middle of a great Muslim Mosque.

The range of cathedrals shown is excellent and includes many of the remoter ones, such as Elne, Tuy, Lugo and Coria; the photographs too are excellent, and so is the general text. This reviewer wishes however that more could have been shown of three developments peculiar to Spain: the central position of the coro, or choir, which so often blocks completely any view of the east end except at fairly close quarters; the quite superb rejas, or iron screens, which surrounded these choirs and which are in spirit more than church furniture; and the colossal carved reredos, direct developments from the travelling altar, which, created by the closest collaboration between architect, sculptor and painter, reached an elaboration and proportion nowhere so impressive as in Spain.

Mention has been made of the difficulties of describing easily the complications of Spanish progress without a chart of some kind. But Mr. Harvey has included in this book a classification of all the principal dates and architects of each cathedral. Would that more books of this nature had such a sensible idea.

NORAH GLOVER [*A*]

Neue Kirchen im Erzbistum Köln 1945–56, by *Willy Weyres*. 9¾ in. 193 pp. + 106 pp. of illus. Düsseldorf: L. Schwann. 1957. £2 6*s*.

Improvised church building as in *Die 48 Notkirchen in Deutschland* has been left far behind in the Archbishopric of Cologne, where, between 1945 and 1956, a host of new permanent churches has been built and many major reconstructions of war-damaged churches completed. A more embracing review of recent German Roman Catholic churches is thus possible than *Neue Kölner Kirchen* provides. Diagrammatic maps of the diocese and, to a larger scale, of the cities of Essen, Düsseldorf and Cologne give the whereabouts of these buildings.

The illustrations are of particular interest and well produced. As in the monograph on Dominikus Böhm, most of the churches are first shown orthographically in drawings of masterly simplicity, followed by excellent photographs. Fortunately, as a direct comparison of *Sixty Post-War Churches* with Willy Weyres' book is impossible, it need not be attempted.

The illustrations of the reconstruction of heavily war-damaged churches, whether Gothic, Baroque or 19th-century Revivals, disclose a refreshingly virile approach. There has been no pandering to the archaeological mind and the attempt to reconstruct in a 20th-century manner is more truly traditional. As may be expected, there have been many architectural failures, but they are valiant failures. The reconstruction of the Franciscan Church in the Ulrichgasse, Cologne, should make us bewail the opportunities we have not seized.

Most of the new churches may be tagged 'Symbolic-Reductionist'. It is sobering to observe how inexpressibly vulgar modern construction can be when applied to church building otherwise than by a Master. Amongst all these competent churches, only a handful have real significance as modern churches and fewer still approach a Theological Affirmation.

In planning, these churches are often simple and direct and many have been influenced by the Liturgical Movement. As a source book for Anglican Churches, those unversed in matters ecclesiological should 'lift' circumspectly.

G. G. PACE [*F*]

Neue Läden, by *Konrad Gatz* and *Fritz Hierl*. 2 Vols. 12 in. Munich: Callwey. 1956. £7 7*s*.

Some readers will recall two solid volumes on shops published by the same authors in 1950. Since then there have been many developments in display and sales techniques, and an immense number of shops have inevitably been built. Messrs. Gatz and Hierl and their publishers therefore felt justified in making another approach to the subject. The result is not a new edition, but a vastly expanded and largely rewritten major work, arranged in two volumes and five parts. Part 1 deals with general planning considerations: Part 2 studies the particular requirements of different trades: Part 3 is concerned with the technical aspects of all those building elements and items of equipment which are used in shops. Each of these three sections is illustrated with what, to the English eye, seems an almost bewildering profusion of sketches and detail drawings. Part 4 consists of well over 200 pages of photographs, with some plans, of recently completed shops in many countries. There is a glossary of technical terms in five languages, including, of course, English; and a long list of manufacturers of shop fittings and specialists in equipment for the retail trades in Germany (with their addresses). Part 5, which forms the second volume, comprises 96 full-page plates of details.

Neue Läden is a tremendous affair; the type of work which only Germans seem capable of compiling. Nothing is left to the imagination, or indeed to the initiative, of the reader, but one is tempted to wonder whether the busy architect needs to be told so much before he sits down at the drawing board. J. C. P.

Review of Construction and Materials

This section gives technical and general information. The following bodies deal with specialised branches of research and will willingly answer inquiries.
The Director, The Building Research Station, Garston, near Watford, Herts. Telephone: Garston 4040.
The Officer-in-charge, The Building Research Station Scottish Laboratory, Thorntonhall, near Glasgow. Telephone: Busby 1171.
The Director: The Forest Products Research Laboratory, Princes Risborough, Bucks. Telephone: Princes Risborough 101.
*The Director, The British Standards Institution, 2 Park Street, London, W.*1. *Telephone: Mayfair* 9000.
*The Director: The Building Centre, 26 Store Street, London, W.C.*1. *Telephone: Museum* 5400 (10 *lines*).
*The Director, The Scottish Building Centre, 425–7 Sauchiehall Street, Glasgow, C.*2. *Telephone: Douglas* 0372.

The Bristol Building Centre Ltd. Reference has been previously made in the JOURNAL to the proposal to form a Building Centre at Bristol, and it is now in operation, having been officially opened on 6 December. At the inaugural ceremony Mr. E. F. Tew [*F*], President of the Bristol and Somerset Society of Architects, occupied the chair and welcomed the large and representative gathering; he then called on Mr. George Grosvenor, C.B.E., F.I.O.B., to open the centre, which is situated in Stonebridge House, Colston Avenue, Bristol.

In proposing the vote of thanks Mr. John Collins [*A*], Chairman of the Centre, paid tribute to the hard work put into the project by Mr. R. Towning Hill [*A*] and Mr. Raymond Moxley [*A*]. Mr. Tew particularly welcomed the presence at the opening ceremony of Mr. Frank Yerbury, O.B.E. [*Hon. A.*], Director of the London Building Centre.

Tube-in-Strip. Imperial Chemical Industries Ltd. have produced a new material in their range of heat transfer products. It is in the form of a tube, or a number of parallel tubes, as an integral part of a sheet or strip of metal, and the name given to it is Tube-in-Strip.

During casting operations rods of inert non-metallic material are incorporated in the rolling slab. In the subsequent rolling the rods break up into fine powder and elongate with the metal as it increases in length, finishing as a layer of fine powder within the strips. The metal is delivered to the customer in the form of sheet or coiled strips, then by applying pneumatic or hydraulic pressure to the positions of the original rods, using a simple form of coupling, a perfectly round tube is 'blown up' along the line of the original rods.

At present Tube-in-Strip is made in copper and aluminium and of tube diameters between ¼ in. and 1 in. Strip widths are up to 22 in. for copper and up to 26 in. for aluminium, and uninflated the material may be obtained in lengths up to 500 ft., depending on the gauge of strip required. I.C.I. suggest that the material lends itself to use as architectural panels and structural work, domestic, office and industrial radiators, and skirting board panels.

Tubes of different sizes and of any desired spacing may be incorporated in the same strip, and in each case the thickness of the inflated tube wall is half that of the connecting web or fin. Further particulars may be obtained from I.C.I., Southern Region, Gloucester House, 149 Park Lane, London, W.1.

Sound Insulation in Houses (Scotland). A technical memorandum, No. 3, has been issued to local authorities by the Department of Health for Scotland; it has been prepared in consultation with the Building Research Station. The purpose of the memorandum is to give guidance mainly on methods of construction which make use of traditional materials, including the slender wall construction described in a previous memorandum. The forms of construction outlined in the document should not be regarded as the only methods; there may be—the memorandum states—a number of alternatives which equally fulfil the requirements for good sound insulation. The memorandum is mainly meant for dwellings not more than five storeys high.

As, presumably, the decibels of Scotland are much the same as those south of the border, the memorandum is rather a collection of known methods of sound insulation than a revelation of new techniques, but the document states that the expression of the sound insulation value of a wall or floor as an average of its insulation properties over the whole audible range has been found to be misleading, and a system of grades has now been adopted based on the insulation at all frequencies in the audible range. These grades are as follows:

Cottages.

9 in. brick wall grade. In cottages only party walls matter and these are graded as satisfactory or not satisfactory, taking the performance of a 9 in. solid brick wall as the minimum acceptable to the majority of cottage-dwellers.

Flats and Maisonettes.

Grade I insulation is such that the noise of neighbours is not an obtrusive feature of living in the dwellings. It is also the best insulation that is practicable for floors.

Grade II insulation is such that while the noise of neighbours is to many occupants the most obtrusive feature of living in the dwellings, at least half the occupants are not seriously disturbed.

The memorandum is well illustrated by 16 sheets of clear drawings. It can be purchased from H.M.S.O. for 4s., and it may usefully be read in conjunction with B.R.S. Digest No. 88, "Sound Insulation of Dwellings," Part I and Digest No. 89, Part II.

At the opening of the Bristol Building Centre; L.–R.: Mr. R. Towning Hill, Mr. F. R. Yerbury, Mr. Raymond Moxley, Mr. E. F. Tew, Mr. John Collins, Chairman of the Bristol B.C., Mr. F. Clarke, Consulting Engineer, and Mr. George Grosvenor, Past-President, N.F.B.T.E.

Blue Circle Group Cement Works. On 27 September the Rt. Hon. Hugh Molson, M.P., Minister of Works, officially opened the Blue Circle Group's new cement making plant at Cauldon Low in Staffordshire. This plant, built at a cost of some £3½ million, is the only one of its kind at the present time in England as it employs the semi-dry process of cement making and not the wet process which is in general use in this country. In the wet process lime and shale are proportioned and ground together with sufficient water to make a free-flowing slurry containing about 40 per cent moisture, which is fed to the kiln in this form, whereas in the semi-dry process the raw materials are dried and ground together to form a powder which is subsequently nodulised with 12 to 14 per cent water before passing to the kiln. The saving on the fuel consumption of this type of cement plant is stated to be as much as 40 per cent on kiln fuel; a saving of importance bearing in mind that the Blue Circle Group used nearly 2½ million tons of coal in 1956.

The Cauldron Low works will add an annual tonnage of 200,000 to the Group's productive capacity and to maintain a high quality of the product continuous testing is carried on throughout the 24 hours of each day.

At a recent Press view the commendably clean layout of the plant was obvious and also the comparative freedom from dust. As far as possible automation governs the various processes as the limestone in the hillside is crushed, ground, heated and filtered until it emerges as cement packed in bags on the waiting lorries.

The entire project was designed by the Associated Portland Cement Manufacturers Ltd. and Messrs. G. and T. Earle Ltd., the civil engineering consultants were Messrs. Oscar Faber and Partners. Sir Alfred McAlpine and Sons Ltd. carried out the initial site clearance, Messrs. George Wimpey and Company Ltd. were the main civil engineering contractors, and Messrs. Bierrum and Partners Ltd. built the precipitators and the 250 ft. high reinforced concrete chimney.

Housing for the staff and workmen is being provided on an adjoining site, the architects being Messrs. Forshaw, Massey and Greaves [*AA*] and the contractors Messrs. J. A. Bailey & Son (Builders) Ltd.

Small-Pipe Central Heating. Although central heating can be the most efficient and cheapest form of house warming, yet it has certain disadvantages in that the cost of installation may be high and the appearance in the rooms of comparatively large diameter pipes can be unsightly. If such an installation is inserted in an existing house the walls, partitions and floors necessarily suffer by the passing through of large pipes and redecoration may have to be done.

With these matters in mind the British Coal Utilisation Research Association (called for short B. Cura) have for the past six years been carrying out research with the object of reducing the installation costs of a full central heating system to a level within the reach of a larger section of the population and of producing a system more efficient in operation, thus reducing running costs. The research has resulted in the B. Cura system of small-pipe, forced circulation central heating suitable for the medium-sized house, up to 1,500 sq. ft. of floor area.

The essential elements of the system include a thermostatically controlled boiler, an indirect cylinder, an electric circulating pump, a mixing valve, a by-pass, and, of course, the usual supply and expansion cisterns, etc. The circuit to the radiators is in ½ in. copper or ⅜ in. ungalvanised piping, which can be run inconspicuously along skirting boards and up behind window curtains; they can be passed through walls and floors with the least detriment to them in the way of making good. The central heating can be adjusted without altering the setting of the control on the boiler, so that the central heating and the hot water supplies are largely independent of each other. Control of the by-pass valve to accord with the outside temperature is effected by a small bulb, fixed outside the house, which contains fluid that contracts when the outside temperature falls and by means of a small pipe causes movement in the by-pass valve; by this means the radiator temperatures are automatically reduced in milder weather without interfering with the supply of hot water for domestic purposes.

The indirect cylinder is connected to the boiler by a separate gravity flow circuit through 1¼ in. pipes and so is unaffected by the circulation in the radiator system. This hot water circuit acts as a safety precaution, so that if the circulator is switched off there is no risk of the water in the system boiling. Further technical details may be obtained from the Coal Utilisation Council, 3 Upper Belgrave Street, London, S.W.1.

Stelvetite. This material is steel sheet with a plastic coating in a range of colours and embossed patterns. This outer plastic surface is a permanent and complete finish although the sheet can be worked and treated as ordinary steel sheet. Stelvetite can be had in steel gauges from 26 G. (0·0196 in.) to 16 G. (0·0625 in.); in sheet lengths up to 12 ft. and widths up to 4 ft. The P.V.C. coating is 0·014 in. thick. The makers claim the following characteristics for this new material: resistance to acids and alkalis within wide limits, resistance to abrasion, weather and humidity, oils and greases; that it has good electrical properties, does not support combustion, can be washed and cleaned with most detergents; that it is warm and pleasant to touch, and is stable at temperatures higher than those associated with P.V.C. alone.

Among the applications suggested by the makers are: wall panelling, furniture, interior trim and panelling, cabinets, partitioning and doors. The material has been developed by Messrs. John Summers and Sons Ltd. in conjunction with Messrs. B.X. Plastics Ltd., and inquiries should be addressed to Dept. MRD/21, John Summers and Sons Ltd., Shotton, Chester.

British Standards Recently Published

B.S. 988: 1957. **Mastic Asphalt for Roofing (Limestone Aggregate).** This revised Standard represents one stage in the revision of the entire series of British Standards dealing with mastic asphalt for building purposes. (*Note:* B.S. 1162: 1957, Mastic Asphalt for Roofing (Natural Rock Asphalt Aggregate) was mentioned in the September issue of the JOURNAL, p. 471).

B.S. 988 (revised) deals with mastic asphalt roofing composed of ground limestone incorporated with one of three types of asphaltic cement, normally with an added coarse aggregate. The original 'limestone' and 'grit' clauses have been combined into an 'aggregate' clause which deals separately with fine and coarse aggregate. A section of the Standard is devoted to manufacture of the mastic asphalt and to its subsequent re-melting on the site. The B.S. number is one of the marks required to appear on the blocks of asphalt. Price 4*s.* 6*d.*

The R.I.B.A. representative on the drafting committee was Mr. A. J. Fagg [*A*].

B.S. 1386: 1957. **Copper Tubes to be Buried Underground.** This revised Standard provides for tubes having the same applications as those in the 1947 edition and which are therefore suitable for connection by means of compression or capillary fittings or by bronze or autogenous welding. The value of the maximum tensile strength for annealed tubes and the minimum tensile strength for as-drawn tubes have been reduced from 17 to 16·5 tons per sq. in., and the angle of drift has been amended to 45 degrees, which is the angle now adopted in all British Standards for copper and copper alloy tubes.

Tubes are standardised on the basis of outside diameter; thus the O.D. selected for each size is as laid down in B.S. 659: 1955, one wall thickness being recognised as standard for each nominal size. Price 3*s.*

The R.I.B.A. representative on the drafting committee was Mr. D. W. Aldred [*F*].

B.S. 2908: 1957. **Precast Concrete Eaves Gutters.** The requirements of this Standard reflect the result of an investigation in which more than nine hundred local authorities were asked to comment on their experience of the use of this type of gutter. Minimum requirements are specified for units of the type intended for bedding on the walls of buildings. The Standard relates to the quality and performance of the units themselves and not to the gutters when laid, but an appendix gives a recommendation for jointing.

Although the cross sectional area of the waterway and tolerances on overall dimensions are given, the actual dimensions and shape of the units are left for the manufacturer to decide, and all gutters are intended to be lined unless otherwise agreed. Price 4*s.* 6*d.*

The R.I.B.A. representative on the drafting committee was Mr. F. H. Heaven [*A*].

Notes and Notices

NOTICES

Science Lecture, Tuesday 21 January 1958 at 6 p.m. There will be a Science Lecture on Tuesday 21 January 1958 at 6 p.m., when Sir Herbert Manzoni, C.B.E., M.I.C.E., will read a paper on 'Public Parking Garages'.

(Light refreshments will be provided before the lecture.)

Fourth General Meeting, Tuesday 4 February 1958 at 6 p.m. The Fourth General Meeting of the Session 1957–58 will be held on Tuesday 4 February 1958 for the following purposes:—

To read the Minutes of the Third General Meeting held on Tuesday 7 January 1958.

Mr. Basil Spence, O.B.E., A.R.A., A.R.S.A., Hon. Secretary, to present the film on Coventry Cathedral.

Mr. Peter F. Shepheard, B.Arch., A.M.T.P.I., F.I.L.A. [*A*], to read a criticism of the designs and drawings submitted for the Prizes and Studentships 1958.

The President, Mr. Kenneth M. B. Cross, M.A., to present the Medals and Prizes 1958.

(Light refreshments will be provided before the meeting.)

Session 1957–1958. Minutes II. At the Second General Meeting of the Session 1957–1958 held on Tuesday 10 December 1957 at 6 p.m., Mr. Kenneth M. B. Cross, M.A., President, in the Chair.

The meeting was attended by about 320 members and guests.

The Minutes of the Inaugural General Meeting held on Tuesday 5 November 1957, having been published in the JOURNAL, were taken as read, confirmed and signed as correct.

The following members attending for the first time since their election were formally admitted by the President: *As Fellows:* Mrs. I. L. E. Austin-Smith, J. M. Austin-Smith, J. L. Berbiers, K. R. Smith. *As Associates:* A. Artur, M. B. Blair, C. D. Bourchier, Miss R. M. Burnett, J. J. Butler, A. G. Horwell, L. B. Ingram, H. C. Johnson, A. S. King, J. Wasdale Lee, G. H. Maclean, P. E. J. Parker-Jones, G. M. Petit-Jean, E. G. Prior, J. A. Stent, M. E. Woodford.

The President then presented a Diploma in connection with the R.I.B.A. Award for Distinction in Town Planning to Mr. Arthur G. Ling B.A.(Arch.), M.T.P.I. [*F*].

Sir John Cockcroft, O.M., K.C.B., C.B.E., F.R.S., Ph.D., D.Sc., Director of the Atomic Energy Research Establishment, Harwell, having read a paper on 'Building for Atomic Energy', a discussion ensued and on the motion of Sir Charles Mole, K.B.E., M.V.O. [*F*], Director-General of the Ministry of Works, seconded by Mr. T. L. Viney [*F*] of the Department of Atomic Energy, Risley, a vote of thanks was passed to Sir John Cockcroft by acclamation and was briefly responded to.

The proceedings closed at 7.50 p.m.

Publicity. The Practice Committee recommend members to see that, when writing or approving an article or descriptive note for the Press, technical or otherwise, relating to a completed building, the names of the quantity surveyor and contractor are always mentioned.

Building Surveying Examination. The R.I.B.A. Examination qualifying for candidature as Building Surveyor under Local Authorities will be held at the R.I.B.A. on 23, 24 and 25 April 1958. Applications for admission to the examination must be made not later than 14 February on the prescribed form to be obtained from the Secretary, R.I.B.A.

Annual Subscriptions and Contributions. Members' subscriptions and Students' contributions for 1958 became due on 1 January.

	£	s.	d.
Fellows	10	10	0
Associates	6	6	0
Licentiates	6	6	0
Students	2	2	0

For members resident in the trans-oceanic Dominions who are members of Allied Societies in those Dominions, and for members resident overseas in areas where no Allied Society is available, the amounts are as follows:

	£	s.	d.
Fellows	6	6	0
Associates	4	14	6
Licentiates	4	14	6

British Architects' Conference 1958. The British Architects' Conference 1958 will be held at Newcastle upon Tyne from 14 to 17 May at the invitation of the Northern Architectural Association. Full details of the programme will be published in due course. Particulars of accommodation in hotels is given below.

Luncheon and Tea Facilities for Members. Members are reminded that there is a self-service dining room on the second floor of the R.I.B.A. building where luncheons are served between 12 noon and 2 p.m. on weekdays except Saturdays. The dining room is open to members and Students. There is a 'Club' licence and drinks can therefore be obtained with meals. Members may bring guests.

Morning coffee and afternoon teas have hitherto been served in the Members' Room on the first floor. Owing to the rebuilding programme the Members' Room has to be taken over for temporary office use and the service of coffee and teas will, during the period of rebuilding, be available on the second floor landing.

Kalendar 1957–1958. Correction. On page 272 in the new edition of the Kalendar the entry 'A Hinchcliffe: Terence, DIP.ARCH.(Leics.)' should read:

A **Hinchliffe:** Terence, DIP.ARCH.(Leics.).

Cessation of Membership. Under the provisions of Bye-law 21 the following has ceased to be a member of the Royal Institute: as Associate—Reginald Alfred Mendenhall.

BRITISH ARCHITECTS' CONFERENCE, NEWCASTLE UPON TYNE, 14–17 May 1958

List of Hotels

The local Conference Committee have made provisional reservations at the following hotels, which will hold good until 28 February 1958. Members wishing to reserve accommodation for the Conference should write direct to the hotel of their choice, *making particular mention of the British Architects' Conference.*

Hotel	*Rooms*		*Charge Bed and Breakfast*	*Garage*
	Double	*Single*		
*Cairn Hotel Osborne Road. Newcastle upon Tyne, 2	4	10	22/–	—
County Hotel Newcastle upon Tyne, 1	12	6	37/6	Yes—200 yards away
Crown Hotel Clayton Street West, Newcastle upon Tyne, 1	20	20	27/6	Yes—200 yards away, and parking
Douglas Hotel, Newcastle upon Tyne, 1	8	10	30/–	Yes—200 yards away
*Gordon Hotel, Clayton Road, Newcastle upon Tyne 1	12	3	30/–	Parking
Imperial Hotel, Jesmond Road, Newcastle upon Tyne, 2	12	6	26/6	Yes
Royal Station Hotel, Newcastle upon Tyne, 1	80	30	41/–	Yes—200 yards away and parking for 12 cars
Royal Turk's Head Hotel Grey Street, Newcastle upon Tyne, 1	40	20	37/6	Limited parking
Tynemouth (10 miles from Newcastle)				
Grand Hotel, Tynemouth (overlooking sea)	12	—	30/–	Parking
Whitley Bay (10 miles from Newcastle)				
Rex Hotel, Whitley Bay Promenade	20	10	25/–	Yes, and parking
Esplanade Hotel, Whitley Bay Promenade	20	—	25/–	Yes (for 3 cars) and parking (for 6 cars)
Durham (16 miles from Newcastle)				
Three Tuns Hotel, Durham	9	1	30/–	Parking
Royal County Hotel, Durham	28	12	30/–	Yes

* Hotels marked with an asterisk are unlicensed. All the others are licensed.

COMPETITIONS

Reinforced Concrete Factory Building. Last date for submitting designs: 1 April 1958.

Full particulars were published in the JOURNAL for December, page 69.

International Competitions

Competition for a Monument to General Rivera. Notice has been received from the International Union of Architects that an international competition has been organised by a national committee in Montevideo (Uruguay) for the erection of a monument in honour of General Rivera.

The Sociedad de Arquitectos del Uruguay were not consulted and the regulations do not conform to the I.U.A. Regulations for International Competitions.

Members and Students are accordingly warned not to take part in this competition.

The conditions of the following competitions have been approved by the International Union of Architects:

City Hall and Square for Toronto, Canada. Some particulars were published in the JOURNAL for October, page 511, and additional information in the JOURNAL for November, page 31.

Last date for dispatch of submissions in the preliminary competition: 28 March 1958.

Last date for dispatch of submissions in the final competition: 29 August 1958.

Development of Berlin Centre. Last day for submitting designs: 1 February 1958.

Full particulars were published in the JOURNAL for May, page 287, with an amendment in the JOURNAL for October, page 511.

COMPETITION RESULT

Enfield Civic Centre

1. Eric G. Broughton [*A*].
2. Clifford Culpin [*F*].
3. Anthony R. Osborne [*A*].

Commended

The Architectural Group (K. S. Mobsby [*A*], G. M. Jennings [*A*] and Associates); Grenfell Baines and Hargreaves [*A*/*A*]; J. B. F. Cowper and K. M. Poole [*F*/*A*]; F. Hamer Crossley [*F*] in association with H. H. Powell [*F*]; Eric Hardy and Anthea Hardy [*A*/*A*]; J. P. Lomax and E. G. Dodds [*A*/*A*]; Shingler and Risdon [*F*] and William Wakeling [*A*]; Donald R. Stewart and E. R. Saxon Snell [*A*/*L*]; Clifford Strange [*L*].

BOARD OF ARCHITECTURAL EDUCATION

R.I.B.A. Examination in Professional Practice and Practical Experience. The Examination in Professional Practice and Practical Experience was held in London and Edinburgh on 18 and 19 November 1957. Of the 261 candidates examined, 230 passed and 31 were relegated. The successful candidates are as follows:—

Alston: H. K.
Amos: B. E.
Andrews: Peter
Babister: B. A. W.
Bain: Andrew
Baker: G. C.
Barnes: J. F. L.
Barron: B. M.
Barry: James
Bath: J. A.
Baxter: W. J.
Bedford: A. C.
Bellamy: T. A.
Bentley: Joe
Bharucha: B. A.
Bhonsule: N. A.
Bird: P. B.
Blake: C. H.
Blythe: A. C.
Bone: A. F.
Bottomley: Keith
Bradford: S. W.
Bradley: J. R.
Braim: E. L.
Bray: A. K.
Briggs, H. G.
Brooks: M. A.
Bryan: P. C. R.
Buckle: J. C.
Burgess: G. B.
Burns: E. E.
Burt: R. G.
Butterworth: N. A.
Cantwell: F. J.
Cassidy: Liam
Caswell: P. H.
Clapham: J. E. S. (Miss)
Combs: Harold
Corke: H. E. J.
Cove: R. E.
Cowell: P. M.
Czezowski: J. S.
Dabrowski: J. H.
Darrington: P. W. J.
Davey: J. W.
Davis: C. F.
Davis: J. D. T.
Davis: K. S.
Davis: P. C.
Deaves: A. R.
Dees: A. N.
De Mott: L. T.
Dietz: J. E. M.
Dixon: Thomas
Dobson: Victor
Dodgson: G. T.
Dolman: Alan
Dowling: J. W.
Downing: Clifford
Downs: Allison (Miss)
Dunster: Peter
Edwards: S. L.
Etherington: T. G.
Evans: G. F. H.
Evans: J. D.
Farrance: C. W.
Field: G. H.
Firth: G. C.
Fisher: Alan
Fisher: H. W.
Fisher: S. R.
Fleming: D. H.
Forrest: D. W.
Freak: G. A.
Gallimore: A. K.
Gazzard: Donald
Green: Norman
Grinyer: Roy
Groves: A. J.
Grundy: C. B.
Haddon: P. F.
Hadley: Keith
Hammond: P. D.
Hammond: P. R. V.
Hardy: A. J.
Hartnell: T. R.
Hartry: T. K. (Mrs.)
Haskett: A. S. S.
Haughey: P. J.
Heath: E. B.
Heffer: Michael
Higgins: C. P. H.
Hill: Brian
Holliss: E. D. M. (Miss)
Hook: R. D. C.
Howard: C. F.
Hoyer: S. W.
Hughes: T. R.
Hull: Alwyn
Hulls: C. M.
Humphrey: C. R.
Hussein: Messoud
Ickeringill: A. J.
Ingle: I. G. J.
Ioannides: C. P.
Jacoby: William
Jones: Roy
Kay: M. J.
Keep: M. B.
Kenzie: R. W.
Knowles: K. S.
Kolka: Boleslaw
Lander: S. F. P.
Large: W. E.
Larkin: G. D.
Lawrence: R. H.
Lawson: S. R.
Leach: Eric
Lincoln: Frederick
Lloyd: J. S.
Lock: D. J.
Luetchford: Hugh
Lyle: D. L.
Lynch: John
Lynton: J. A.
McArdle: M. P. O. (Miss)
McDougall: J. C.
McGrath: J. M.
McGurk: Thomas
McLaren: D. P.
Maciejowski: B. L.
Malcolm: T. J.
Malton: J. V.
Mannings: M. J.
Marshman: A. A. J.
Martin: J. H.
Massey: Harry
Matten: D. N.
Maunder: P. L.
Melhuish, N. D.
Metcalfe: P. E. M.
Michael: A. D.
Michaelian: Haikaz
Michelmore: R. A.
Mohe: R. V.
Montague: D. J.
Morrow: N. S.
Moss: B. F.
Murkin: N. D. A.
Muszynski: Jan
Mutter: John
Naylor: B. P.
Neale: N. W.
Newin: M. H.
O'Keeffe: Patrick
Orrin: R. A. W.
Packer: R. J.
Pate: J. G. L.
Patkar: L. R.
Pearson: J. E. T.
Pepper: A. E. J.
Pestell: L. D.
Peters: A. P.
Pickering: Alan
Pink: G. M.
Portsmouth: J. H. S.
Pratt: J. T.
Preston: J. R.
Pritchard: W. J.
Purcell: W. V.
Pye: J. R.
Rahim: M. J. A.
Rainbow: J. A. A.
Rivers: H. F.
Roe: A. L.
Rogers: P. G. H.
Rogerson: I. P. L.
Rome: A. M.
Rookley: W. P.
Ross: John
Rouse: J. L.
Rowland: W. J.
Sampson: W. B.
Samuel: R. J.
Sanderson: R. M. K.
Scampton: A. B. (Mrs.)
Scoble: G. J.
Scoggins: B. K.
Shadwell: K. G.
Sikorska: Irena (Mrs.)
Simpson: Robert
Smith: K. G.
Smith: G. R.
Smith: J. T.
Snadden: R. W. M.
Spiwak: H. J.
Stanger: George
Stapleton: E. S.
Stephens: E. J.
Stevens: A. F.
Stirgess: Lionel
Straiton: J. T.
Sutherland: R. L.
Sweeney: T. P.
Tansley: Kenneth
Tasker: Kenneth
Taylor: A. J.
Thompson: H. T.
Tilley: J. C.
Tucker: D. S.
West: G. E.
White: M. L. M. (Mrs.)
Widdup: George
Williams: N. D.
Willis: F. A.
Wilson: J. K.
Wood: J. H.
Wood: P. J.
Wolpert: D. B. J.
Woodhouse: P. A.
Woolnough: G. J.
Worboys: R. J.
Wornell: A. J. C.
Worth: K. F. G.
Worts: J. B.
Wotton: D. A.
Wright: Eric
Yabsley: J. F.
Young: David
Young: J. K.

The R.I.B.A. Intermediate Design Prize and Victory Scholarship Competitions 1958–1959. The attention of intending competitors is called to the fact that the closing date for the submission of forms of application for these competitions is 17 January 1958.

The R.I.B.A. Intermediate Design Prize, a certificate and the sum of £100, for the study of contemporary architecture in Europe, is confined to Probationers and elected Students of the R.I.B.A. and elected Students of Dominion Allied Societies who have passed the R.I.B.A. Intermediate or equivalent examination, or produce certificates from members of the R.I.B.A. to the effect that they have reached the required standard. Students who have passed the R.I.B.A. Final or equivalent examination or who will have passed the R.I.B.A. Final or equivalent examination at the time of the *en loge* competition are not eligible to compete.

Under the arrangements for the competition, only one *en loge* competition will be held. This will take place in London and at non-Metropolitan centres on Tuesday 18 March 1958.

The Victory Scholarship, a Silver Medal and the Sum of £120 is confined to members of the R.I.B.A. and of the Allied Societies Overseas and elected Students of the R.I.B.A. and of Allied Societies Overseas, who have passed the R.I.B.A. Final or equivalent examination, or who have produced certificates from members of the R.I.B.A. to the effect that they have reached the required standard. With regard to the R.I.B.A. Final or equivalent examination, Students need not have passed the Professional Practice Examination to be taken after twelve months' practical experience.

The *en loge* competition for the Victory Scholarship will be held on the same day as that for the R.I.B.A. Intermediate Design Prize, i.e. Tuesday 18 March 1958.

Forms of application for admission to the competitions may be obtained from the Secretary, R.I.B.A.

ALLIED SOCIETIES

Changes of Officers and Addresses

New Zealand Institute of Architects, Taranaki-Wanganui-Manawatu District Branch. Hon. Secretary and Treasurer, D. J. Taylor, c/o P.O. Box 282, Palmerston North, New Zealand.

Royal Architectural Institute of Canada. Mr. C. J. G. Carroll has resigned as Secretary.

Bristol and Somerset Society of Architects. At Home. The President of the Society, Mr. Ernest

F. Tew [*F*], and Mrs. Tew were At Home to members and their friends on Tuesday 19 November 1957. The reception was held at the Guildhall, Bath, and was attended by about 150.

Devon and Cornwall Society of Architects. Annual Banquet and Ball. The Society's annual banquet and ball was held on Friday 15 November at the Carlyon Bay Hotel, St. Austell. Mr. Geoffrey Bazeley [*F*], the President, was unfortunately prevented by illness from attending, and the Senior Vice-President of the Society, Mr. John Radford [*A*], deputised for him. He replied to the toast of the Society proposed by Mr. J. Francis Smith, F.R.I.C.S. [*F*], Chairman of the Devon and Cornwall Branch of the R.I.C.S.

The toast of the R.I.B.A. was proposed by Brigadier W. Leslie, C.B.E., a Deputy Lieutenant of the Duchy of Cornwall, and the reply was made by Mr. J. H. Forshaw, C.B., Vice-President R.I.B.A. Mr. G. B. Drewitt [*F*], Chairman of the Truro Branch, proposed the toast of The Guests and Mr. T. A. Inch, J.P., Chairman of the St. Austell U.D.C., responded.

Amongst other guests were Mrs. J. H. Forshaw, Canon Fison, Sub-Dean of Truro Cathedral, and Mrs. Fison, Mr. E. Dennis, President of the S.W.F.B.T.E., and Mrs. Dennis, Mr. W. R. Ellis, Deputy Secretary R.I.B.A., and Mrs. Ellis.

Essex, Cambridge and Hertfordshire. Society of Architects. R.I.B.A. Architecture Bronze Medal. Nomination forms, in respect of the above triennial award for buildings erected between 1 January 1955 and 31 December 1957 within the area of the Society, may be obtained by written application to the Hon. Secretary of the Society, Mr. R. Owen Vine [*F*], Tudor Chambers, Station Road, London, N.22.

Last day for submission of nomination forms, together with photographs and drawings: Noon, Friday, 28 February 1958.

Hampshire and Isle of Wight Architectural Association. R.I.B.A. Architecture Bronze Medal. Nomination forms, with regard to the above award for buildings completed in the area of the Association during the three years ended 31 December 1957, are obtainable from the Hon. Secretary, Mr. G. F. Gutteridge [*A*], of 140 Lodge Road, Southampton, and should be submitted not later than 31 January 1958.

Liverpool Architectural Society. Annual Dinner and Dance. The Society's annual dinner and dance was held on Wednesday 27 November 1957 at the Adelphi Hotel, Liverpool.

The President of the Society, Mr. L. W. M. Alexander, A.R.I.C.S. [*A*], was in the chair and among the guests were the President, R.I.B.A., Mr. Kenneth M. B. Cross, accompanied by the Secretary, Mr. C. D. Spragg, Mr. H. Leslie Bowes, C.B.E., Chairman of the Liverpool Chamber of Commerce, and the Lord Mayor of Liverpool, Alderman F. H. Cain.

Mr. Bowes proposed the toast of the R.I.B.A., and Mr. Cross responded, and Mr. Alexander proposed the toast of The Guests, to which the Lord Mayor replied.

Nottingham, Derby and Lincoln Society of Architects. Annual Dinner. The Society's annual dinner was held on Friday 15 November at the Welbeck Hotel, Nottingham. The President of the Society, Mr. S. F. Barrell [*A*], was in the chair and among the guests were Mr. Harold Conolly, C.B.E., Vice-President R.I.B.A., who represented the R.I.B.A. in place of the President, the Lord Mayor of Nottingham, Alderman W. Hickling, the Bishop of Southwell, the Rt. Reverend F. Russell Barry, and the Secretary R.I.B.A., Mr. C. D. Spragg.

Mr. Barrell proposed the toast of The Cities of Nottingham, Derby and Lincoln, and the toast of the R.I.B.A. and Allied Societies was proposed by Mr. George H. Spencer, J.P., President of the Nottingham Chamber of Commerce, to which Mr. Conolly replied. The toast of The Guests was proposed by Mr. Barrell and Professor J. A. Pope, M.I.Mech.E., President of the Nottingham Society of Engineers, replied.

Notes from the Minutes of the Council

MEETING HELD ON 10 DECEMBER 1957

Appointment of R.I.B.A. Representatives

(*a*) *Ministry of Works: Building and Civil Engineering Regional Joint Committee for London.* John C. Stillman [*A*] in place of Richard Sheppard [*F*]—resigned.

(*b*) *B.S.I. Committee B*/76: *Thermo-Plastic Flooring Tiles.* R. A. Cooksey [*F*] in place of A. P. Cooksey [*A*].

Membership. The following members were elected: as Fellows 2; as Associates 57.

Students. 73 Probationers were elected as Students.

Applications for Election. Applications for election were approved as follows: *Election* 4 *February* 1958: as Associates 63. *Election* 15 *April* 1958 (*Overseas Candidates*): as Fellow 1; as Associates 15.

Resignations. The following resignations were accepted with regret: Harry Dudley Clifford-Turner [*A*], Miss Elizabeth Rosemary Edwards [*A*], Leslie Howard Hill [*A*], Mrs. Alice Doreen Iles [*A*], Mrs. Anne Kathleen Tennent [*A*], Vernon John Thurgood [*A*], Herbert Henry Parsons [*L*].

Applications for Transfer to Retired Members' Class under Bye-law 15. The following applications were approved: as Retired Fellow: Herbert Passmore; as Retired Associates: Frank Morrall Maddox, Cecil James Scott; as Retired Licentiates: Destin William Asman, Walter Richard Benwell.

Obituary. The Secretary reported with regret the death of the following members: David Ephimovitch Arkin [*Hon. Corr. Member*], William Haywood [*F*], Ernest Charles Leach [*F*], Dr. Colin Sinclair [*F*], John Stewart Thomson [*F*], Norman Frederic Woodroffe, O.B.E. [*F*], John McLintock Bowie [*Retd. F*], George Morrison Hay [*Retd. F*], David Thomson, M.B.E. [*Retd. F*], William John Ball [*A*], James McIntosh Howarth [*A*], John Norman Keasley [*A*], Bernard Newboult [*A*], Vithal Mukund Patker [*A*], Hugh Graham Rennie [*A*], Leonard Walter Tracey [*A*], Peter Gordon Williams [*A*], William Love Starling [*Retd. A*], Ernest Barber [*L*], Herbert Stanley Bostock [*L*], William Henry Brant [*L*], Edwin Joseph Liddle [*L*], Maurice Yendall [*L*], Reginald James Evans [*Retd. L.*], William Kennedy [*Retd. L.*], Monro A. McIntosh [*Student*].

By resolution of the Council the sympathy and condolences of the Royal Institute have been conveyed to their relatives.

GENERAL NOTES

Reilly Dinner Club. The annual reunion dinner for 1958 will be held at the Adelphi Hotel, Liverpool, on Saturday 26 April.

All old students of the Liverpool School who were there during and up to the time of the retirement of the late Sir Charles Reilly [*F*] are asked to note the date, and to endeavour to attend the function.

On this occasion a visit will be made to the School of Architecture, on the invitation of Professor R. J. Gardner-Medwin [*F*]. Mr. A. C. Townsend [*F*] has again undertaken to organise the reunion and notices for the application for places and further information will be sent out early in the New Year.

Bernard Webb Studentship 1957. The Bernard Webb Studentship for the historical and critical study of architecture, which is open to members of the Architectural Association and tenable under the auspices of the British School at Rome, has been awarded to Mr. John D. Richards [*A*], for a study of the planning and organisation of the Greek colonial cities.

Architectural Association Lantern Slide Collection. The major part of the conversion into 2 in. × 2 in. slides is now carried out, only the Renaissance and a few odd sections are awaiting completion. A large number of colour slides still remain to be mounted and catalogued and not all are likely to be available before the summer.

A.R.C.U.K. Maintenance Scholarships in Architecture. The Architects' Registration Council of the United Kingdom offer for award in June 1958 certain maintenance scholarships in architecture. The scholarships will be renewable from year to year until the student has finished his or her school training. They will be available for students of British nationality who could not otherwise afford such training to enable them to attend architectural schools approved by the Council. Students must, before submitting applications for A.R.C.U.K. maintenance scholarships, ascertain from the local education authority for the district in which they reside whether that authority has any form of financial assistance available in cases such as theirs. Applications will not be considered if no steps have been taken by students to secure such other assistance as may be available. The scholarships will be available both for students who have already begun their training and for students wishing to begin their training. Scholarships will not be granted to students who will be less than 17 years of age on 1 October of the year in which the examination is taken.

Particulars and forms of application may be obtained from: The Secretary to the Board of Architectural Education, Architects' Registration Council of the United Kingdom, 78 Wimpole Street, London, W.1.

Copies of previous years' examination papers may be obtained on payment of 6*d*.

The closing date for the receipt of applications, duly completed, is 31 January 1958.

W.H.O. Fellowship. Mr. R. O. Moss [*A*], Architect's Department, South-East Metropolitan Regional Hospital Board, has been awarded a World Health Organisation Fellowship to study for one month hospital construction in the Netherlands.

R.I.B.A. Cricket Club. A.G.M. and Annual Dinner, 1957. The annual general meeting and the eleventh annual dinner were held at the Architectural Association, Bedford Square, London, W.C.1, on Friday 22 November 1957. The following officers were elected for 1958:

President, P. W. Adams [*F*]; Vice-Presidents, S. B. Caulfield [*F*], T. E. Scott, C.B.E. [*F*], C. D. Spragg, C.B.E., Secretary R.I.B.A., D. S. Taylor [*F*], R. R. Fairbairn, M.C. [*A*], and B. Smyth [*A*]; Club Captain, C. A. R. Norton [*F*]; Vice-Captain and Hon. Secretary, D. L. Robinson [*A*]; Hon. Treasurer, J. G. Batty [*A*]; and Committee Members, R. Case [*S*], G. Fyson [*S*] and A. E. J. Morris [*S*].

The dinner was attended by forty members and guests. The toast of The Club was proposed by Mr. Ian Leslie, O.B.E., to which Mr. Geoffrey Batty replied. The toast of The Guests was proposed by Mr. Kennedy Hawkes [*F*] and Mr. Alan Sears replied.

Any members wishing to join the Club should get in touch with Mr. D. L. Robinson, 29 Chesham Place, London, S.W.1.

Membership Lists

ELECTION: 10 DECEMBER 1957

The following candidates for membership were elected on 10 December 1957.

AS FELLOWS (2)

Daviel: John René Francis, Brighton.
Tyndall: Donald Alfred, Dublin.

AS ASSOCIATES (57)

Aitken: Philip, D.A.(Dundee), Kirkcaldy.
Alcroft: Keith Edwin, Dip.Arch.(Sheffield), Sheffield.
Attree: Arthur Arnald, Dip.Arch.(Manchester), Manchester.
Bain: Donald William, Dip.Arch.(Abdn.), Belfast.
Bellears: Edwin, Linby.
Billington: George Alan, B.Arch.(L'pool), Rainhill.
Bishop: John Michael Venables, D.A.(Edin.), Dunfermline.
Boyer: Ernest Stanley, Chipperfield.
Brimilcombe: Geoffrey Ernest, D.A.(Edin.), Rosyth.
Brown: Alan William John, D.A.(Edin.), Edinburgh.
Buchanan: Edward Redpath, D.A.(Edin.), Armadale.
Burnett: Alan William Graham, D.A.(Edin.), Edinburgh.
Chadwick: Herbert Leslie Hulme, A.R.C.A.
Chipkin: Clive Michael, B.Arch.(Rand.).
Chitty: John George, A.A.Dipl., Welling.
Croll: Norman Hugh, Dip.Arch.(Abdn.), Brentwood.
Crossan: Gerald Mulholland, D.A.(Dundee), Dundee.
Czeiler: (Miss) Yvonne Jeannine, B.Arch. (Dunelm), Newcastle upon Tyne.
Dines: Kenneth George, Huntingdon.
Ferguson: Ian Alexander, Dip.Arch.(Abdn.), Aberdeen.
Gibberd: John Vernon, Dip.Arch.(The Polytechnic), Radlett.
Gill: Michael, D.A.(Edin.), Rosyth.
Grom: Peter Paul, Hebburn.
Gunzburg: (Mrs.) Anna Luise, Birmingham.
Hall: Ian White, D.A.(Edin.), Edinburgh.
Hancock: Thomas Reeves, Dip.Arch.(Leics.), Leicester.
Hawkes: John Edwards Yerrow, Dip.Arch. (Leics.), Leicester.
Herbert: Hugh Grahame, A.A.Dipl.
Jackson: George Edward, Liverpool.
James: Frederick Cottrell, Newport, Mon.
Kennedy: George Raphael Michael, D.A. (Edin.), Stafford.
Kirkland: Allan Wilberforce, D.A.(Edin.), Edinburgh.
Kolek: Zygmunt Edward.
Lunnon: Peter John, Dipl.Arch.(Northern Polytechnic), Bexley.
McInnes: Donald, D.A.(Edin.), Markinch.
Mazuch: Bronislaw.
Moiret: Peter Paul.
Nowak: Zygmunt Julian.
Oliver: George Lawson, D.A.(Edin.), Jedburgh.
O'Neill: Cathal Michael, B.Arch.(N.U.I. Dublin), Dublin.
Paterson: John Lamb, D.A.(Edin.), Edinburgh.
Piet: Zbigniew Jan.
Prior: (Miss) Evelyn Martha.
Prisgrove: Rodney Bryan.
Ramage: John Lowrie, D.A.(Edin.), Melrose.
Scrutton: Frederick Alma, D.A.(Edin.), Edinburgh.
Shaw: Denis, Linby.
Stepan: Olgierd Michal.
Stevens: Brian Joseph, Redditch.
Sutton: Rodney Hale, Dipl.Arch.(Northern Polytechnic).
Toplis: Ian Leslie, Dipl.Arch. (Northern Polytechnic), Gt. Missenden.
Tuckley: Allan, Dip.Arch.(Manchester), Derby.
Valentine: Charles Allan, D.A.(Edin.), Bridge of Allan.
van Breda: Brian Hendrick, B.Arch.(C.T.), Woodford Green.
White: Thomas, D.A.(Edin.), Edinburgh.
Wilson: Charles Jeremy, D.A.(Edin.), Coupar-Angus.
Winter: Roy William, Dip.Arch.(Birm.), Birmingham.

ELECTION: 4 FEBRUARY 1958

An election of candidates for membership will take place on 4 February 1958. The names and addresses of the candidates, with the names of their proposers, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Saturday 18 January 1958.

The names following the applicant's address are those of his proposers.

AS ASSOCIATES (63)

The name of a school, or schools, after a candidate's name indicates the passing of a recognised course.

Adams: (Mrs.) Pauline, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 297E Clapham Road, S.W.9. J. S. Walkden, Peter Goodridge, R. Vaughan.

Adams: Peter Dunstan Renwick, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 297E Clapham Road, S.W.9. J. S. Walkden, Peter Goodridge, R. Vaughan.

Ainsworth: John Dredge, B.A.(Arch.)(Lond.) (Bartlett Sch. of Arch.: Univ. of London), 6 The Chase, Eastcote, Pinner, Middlesex. Prof. H. O. Corfiato, Thomas Ritchie, R. C. White-Cooper.

Allen: Joseph Richard, Dipl.Arch.(Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 94 High Street, Sutton Courtenay, Abingdon, Berks. Reginald Cave, K. A. Stevens, David Beecher.

Ashcroft: Trevor Sanderson, Dip.Arch.(Dunelm) (King's Coll. (Univ. of Durham), Newcastle upon Tyne, Sch. of Arch.), 187 Inner Promenade, St. Annes-on-Sea, Lancs. Prof. W. B. Edwards, Bruce Allsopp, F. Fielden.

Balfour: William Alexander, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 59 Riverview Gardens, Barnes, S.W.13. J. S. Walkden, Peter Goodridge, J. S. Foster.

Bedford-Smith: Adrian, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), 49 Cambridge Road, Birmingham, 14. A. Douglas Jones, T. M. Ashford, Herbert Jackson.

Birnbaum: David Joseph, B.A.(Arch.)(Lond.) (Bartlett Sch. of Arch.: Univ. of London), 9 Carysfort Road, N.16. Prof. H. O. Corfiato, Thomas Ritchie, A. M. Foyle.

Boby: Robin John Pearce, Dipl.Arch.(Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 63 Bartlemas Road, Oxford. Reginald Cave, David Booth, K. A. Stevens.

Booton: Harold William, Dip.Arch.(Dunelm) (King's Coll. (Univ. of Durham) Newcastle upon Tyne, Sch. of Arch.), Myton House, Ingleby Barwick, Nr. Stockton-on-Tees. Prof. W. B. Edwards, J. H. Napper, F. Fielden.

Byron: John Leonard Charles, B.Arch.(L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 30 Ilford Avenue, Great Crosby, Liverpool, 23. Prof. R. Gardner-Medwin, F. H. Crossley, E. H. Ashburner.

Christie: George, D.A.(Glas.) (Glasgow Sch. of Arch.), c/o 30 Norse Road, Glasgow, W.4. Prof. W. J. Smith, Ninian Johnston, A. D. Cordiner.

Cove: William, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 32 Cromwell Road, West Croydon, Surrey. J. S. Walkden, R. H. Uren, R. D. Hammett.

Cunningham: James, D.A., Dip.T.P.(Glas.) (Glasgow Sch. of Arch.), 6 Stenton Crescent, Netherton, Wishaw, Lanarkshire. Prof. W. J. Smith, K. M. Young, T. H. Thoms.

Dash: Michael William, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 28 Greenvale Road, Eltham, S.E.9. J. S. Walkden, Basil Spence, H. W. Rosenthal.

Davie: George Kenneth, D.A., Dip.T.P. (Glas.) (Glasgow Sch. of Arch.), Ravenswood, Cumbernauld, Dunbartonshire. J. A. Carrick, Prof. W. J. Smith, A. D. Cordiner.

Davis: Joseph Malcolm, Dipl.Arch.(U.C.L.) (Bartlett Sch. of Arch.: Univ. of London). 17, Parsonage Lane, Windsor, Berks. Prof. H. O. Corfiato, R. C. White-Cooper, Thomas Ritchie.

Dawes: Ian Johnstone, D.A.(Glas.) (Glasgow Sch. of Arch.), 40 Portland Road, Kilmarnock, Ayrshire. Prof. W. J. Smith, James Houston, A. D. Cordiner.

De Kretser: (Mrs.) Sheila Ann, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 43 Millway, Mill Hill, N.W.7. J. S. Walkden, Alick Low, Greville Rhodes.

De Silva: Sarangu Hewage Nandisena, Dipl. Arch.(U.C.L.) (Bartlett Sch. of Arch.: Univ. of London), 29 Queensborough Terrace, W.2. Prof. H. O. Corfiato, R. C. White-Cooper, A. W. Hall.

Dowling: Robert Henry, B.Arch.(L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 8 Merrion Square, Dublin. J. J. Robinson, P. J. Munden, Vincent Kelly.

Doxat-Pratt: Denys Trevor, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 1 Orchard Court, Worcester Park, Surrey. J. S. Walkden, R. M. Piggott, H. W. Rosenthal.

Elliott: Michael Richard (Final), 175 Havelock Road, Brighton, Sussex. Arthur Wilkinson, L. M. Gotch, K. E. Black.

Evans: Michael Robert, B.A.(Arch.)(Lond.) (Bartlett Sch. of Arch.: Univ. of London), 40 Egerton Gardens, Hendon, N.W.4. Prof. H. O. Corfiato, R. C. White-Cooper, A. M. Foyle.

Ferguson: Ian Robert, Dipl.Arch.(Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 928 Wimborne Road, Moordown, Bournemouth, Hants. Reginald Cave, David Booth, Miss J. G. Ledeboer.

Gobby: Ronald Edwin Ernest (Final), 11 Welbeck Close, New Malden, Surrey. Edwin Rice, Norman Keep, T. E. North.

Goodall: Rodney David, Dipl.Arch.(Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 7 Ennerdale Road, Reading, Berks. Reginald Cave, T. T. Cumming, T. L. J. Chamberlain.

Grierson: Richard Cunningham, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 70 Corringham Road, N.W.11. J. S. Walkden, Frederick MacManus, Peter Goodridge.

Hall: Brian Wynyard, Dipl.Arch.(Oxford)(Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 29 Kellett Road, Hill Lane, Southampton, Hants. Reginald Cave, E. M. Galloway, Ernest Bird.

Heaton: Derek, Dip.Arch.(Cardiff) (Welsh Sch. of Arch.: The Tech. Coll., Cardiff), 17 Tynycae Grove, Rhiwbina, Cardiff. Sir Percy Thomas, Lewis John, Dr. T. A. Lloyd.

Hepburn: John, D.A.(Glas.) (Glasgow Sch. of Arch.), 28 Meldrum Gardens, Maxwell Park, Glasgow, S.1. Prof. W. J. Smith, T. S. Cordiner, Ninian Johnson.

Heymann: Siegfried, Dipl.Arch.(Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 80 Cromwell Road, Cheltenham, Glos. Reginald Cave, Guy Morgan, H. C. Inglis.

Horne: Sydney Charles, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 20 Ainger Road, Primrose Hill, N.W.3. J. S. Walkden, R. H. Uren, R. D. Hammett.

Hunter: John Michael, B.A.(Cantab.), A.A. Dipl. (Arch.Assoc.(London) Sch. of Arch.), 2 Provost Road, N.W.3. J. M. Grice, R. F. Jordon, W. P. Dyson.

Inglis: Thomas Thexton Leith, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 45 Higher Drive, Purley, Surrey. J. S. Walkden, J. S. Foster, Peter Goodridge.

Jelinek: George Walter, Dip.Arch.(The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), 35 Greenhill Park, New Barnet, Herts. J. S. Walkden, H. W. Rosenthal, Peter Goodridge.

Jones: Derek John, Dipl.Arch.(Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 59 High Street, Great Missenden, Bucks. Reginald Cave, C. H. Aslin, H. K. Ablett.

Jones: Raymond John Osmond, Dip.Arch. (Cardiff) (Welsh Sch. of Arch.: The Tech. Coll., Cardiff), 5 Fitzalan Place, Cardiff. Lewis John, Sir Percy Thomas, Dr. T. A. Lloyd.

King: Stuart Reid, B.Arch.(L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 'Norden', Grove Road, Wallasey, Cheshire. Prof. R. Gardner-Medwin, R. R. Young, B. A. Miller.

Kirby: John, Dipl.Arch.(U.C.L.) (Bartlett Sch. of Arch.: Univ. of London), Flat 29, Quentin House, Barons Place, S.E.1. Prof. H. O. Corfiato, R. C. White-Cooper, Thomas Ritchie.

Lawrence: Robert Nicol, D.A.(Glas.) (Glasgow Sch. of Arch.), 146 Barrachnie Road, Garrowhill, By Glasgow. Prof. W. J. Smith, Ninian Johnston, A. D. Cordiner.

Mack: Norman Caldwell, D.A.(Glas.), 4 Colinslee Drive, Paisley, Renfrewshire. Prof. W. J. Smith, J. S. Maitland, A. D. Cordiner.

Malcolm: Ronald McDonald, D.A.(Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 5 Hope Street, Corstorphine, Edinburgh, 12. George Reid, Esme Gordon, W. G. Dey.

Mansell: John, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), 276 Hurcott Road, Kidderminster, Worcs. A. Douglas Jones, G. A. G. Miller, T. M. Ashford.

Marshall: James Robertson, D.A.(Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 58 Clermiston Grove, Edinburgh. Applying for nomination by the Council under Bye-law 3(*d*).

Master: Rohinton Nariman (Final), Leeds College of Art, School of Architecture and Town Planning, 43A Woodhouse Lane, Leeds, 2. B. E. Doctor, S. H. Parelkar, H. N. Dallas.

Owens: Ronald Embleton, B.Arch.(L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 2 Wirral Gardens, Bebington, Wirral, Cheshire. Prof. R. J. Gardner-Medwin, R. R. Young, B. A. Miller.

Parkes: David Henry, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), Cottle's Oak, Frome, Somerset. A. Douglas Jones, Herbert Jackson, M. H. Cooke-Yarborough.

Pratt: Robin Charles: Dipl.Arch.(U.C.L.) (Bartlett Sch. of Arch.: Univ. of London), 29 Nower Hill, Pinner, Middlesex. Prof. H. O. Corfiato, R. C. White-Cooper, A. M. Foyle.

Randall: Peter, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), Lush House, Crane Bridge Road, Salisbury. Richard Sheppard, A. Douglas Jones, Herbert Jackson.

Rennie: Ian Pierce, B.A.(Cantab.), Dip.Arch. (The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), Cheveley, Sonning, Nr. Reading, Berks. Peter Bicknell, J. S. Walkden, J. S. Foster.

Shaw: Percy Alfred (Final), 61 Lisbon Avenue, Twickenham, Middlesex. S. F. Burley, W. H. Clark, Bertram Hume.

Skelcher: Robin Thomas Peter, Dip.Arch. (Birm.) (Birmingham Sch. of Arch.), Messrs. Philip Skelcher and Partners, 17 Poplar Road, Solihull, Warwickshire. A. Douglas Jones, Philip Skelcher, T. M. Ashford.

Smith: Robert Stewart, D.A.(Dundee) (Dundee Coll. of Art. Sch. of Arch.), 462 Perth Road, Dundee, Scotland. John Needham, A. F. S. Wright, W. S. Gauldie.

Spalding: Philip Sydney, Dip.Arch. (The Polytechnic) (The Poly., Regent Street, London: Sch. of Arch.), Flat 1, Fortescue Villas, Gentlemans Row, Enfield, Middlesex. J. S. Walkden, R. H. Uren, R. D. Hammett.

Stonebridge: Anthony Colin, Dipl.Arch.(Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), York House, Witney, Oxon. Reginald Cave, F. T. Pritchard, E. R. Chilton.

Taylor: John Brander, Dip.Arch.(Abdn.) (Aberdeen Sch. of Arch.: Robert Gordon's Tech. Coll.), 'Bhein Lhora', St. Catherine's Place, Elgin, Morayshire. E. F. Davies, F. R. Wylie, Walter Underwood.

Thompson: Brian Pearce, Dipl.Arch.(Oxford) (Sch. of Tech. Art and Commerce, Oxford: Sch. of Arch.), 77 Rosehill Court, Morden, Surrey. R. W. Cave, F. T. Pritchard, J. K. G. Sarjeant.

Tucker: John Frank, Dip.Arch.(Cardiff) (Welsh Sch. of Arch. The Tech. Coll., Cardiff), 'Clynewood', Fernhill Close, Le Mayals, Swansea. Lewis John, Dr. T. A. Lloyd, C. F. Jones.

Tyler: (Miss) Jennifer Rosemary, A.A.Dipl. (Arch.Assoc. (London): Sch. of Arch.), 9 Norland Square, W.11. Arthur Korn, Prof. R. H. Matthew, M. Pattrick.

Walker: (Mrs.) Audrey (née Lyon), B.Arch. (L'pool) (Liverpool Sch. of Arch. Univ. of Liverpool), Threeways, Hinckley, Leics. Prof. R. Gardner-Medwin, Harry Banister, R. A. Threadgold.

Whitson: (Miss) Phyllis Mary, D.A.(Glas.) (Glasgow Sch. of Arch.), c/o County Architects Dept., County Hall, Hertford. Prof. W. J. Smith, C. H. Aslin, A. D. Cordiner.

Wicks: David Forster, B.Arch.(L'pool) (Liverpool Sch. of Arch.: Univ. of Liverpool), 15 Budbury Place, Bradford on Avon, Wiltshire. Prof. R. Gardner-Medwin, H. D. Roberts, F. H. Crossley.

ELECTION 15 APRIL 1958

An election of candidates for membership will take place on 15 April 1958. The names and addresses of the overseas candidates, with the names of their proposers, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Wednesday 29 January 1958.

The names following the applicant's address are those of his proposers.

AS FELLOW (1)

The following Licentiate has passed the qualifying examination:—

Bell: Wilfred, State Housing Department, Lampton Avenue, Glenorchy, Tasmania; 35 Bowden Street, Glenorchy. B. L. Dechaineux, A. L. Crisp, C. E. Philp.

AS ASSOCIATES (15)

The name of a school, or schools, after a candidate's name indicates the passing of a recognised course.

Balsara: Minocher Jehangir (Final), No. 722, Dr. Dinshaw Master Road, Dadar Parsi Colony, Bombay 14, India. Prof. S. S. Reuben, S. H. Parelkar, H. N. Dallas.

Bunn: Clarence Alfred (Passed a qualifying Exam. approved by the R.A.I.A.), Department of Architecture, Texas Technological College, Lubbock, Texas, U.S.A. H. S. Winbush, E. K. Mackay, J. F. D. Scarborough.

Chambers: Guy Cecil (Passed a qualifying Exam. approved by the N.Z.I.A.), 19 Morgan Street, Auckland, S.E.1, New Zealand. Prof. C. R. Knight, Prof. A. C. Light, and the President and Hon. Secretary of the N.Z.I.A. under Bye-law 3(a).

Chitale: Srikrishna Laxman (Final), Oriental Building, Armenian Street, G. T. Madras 1, India. L. M. Chitale, M. G. Desai, Prof. S. S. Reuben.

Chudekar: Sharad Keshavrao (Final), Shri Krishna Bhuwan, 225-A, Sir Bhalchandra Road, Matunga, Bombay 19, India. S. H. Parelkar, Prof. S. S. Reuben, H. N. Dallas.

Chung: Fook Chee, B.Arch.(Auck.N.Z.) (Passed a qualifying Exam. approved by the N.Z.I.A.), E 11 and 12 Union Building, Singapore 1, Malaya. Prof. C. R. Knight, and the President and Hon. Secretary of the N.Z.I.A. under Bye-law 3(a).

Joshi: Dattatray Prabhakar (Final), 63E Keshav Nivas, Portuguese Church Street, Dadar, Bombay 28, India. Prof. S. S. Reuben, G. B. Mhatre, A. S. Patil.

McKeefry: John Montague Augustine, Dip. Arch.(Auck.N.Z.) (Passed a qualifying Exam.

approved by the N.Z.I.A.), c/o Box 543, Palmerston North, New Zealand. W. Thorrold Jaggard and the President and Hon. Secretary of the N.Z.I.A. under Bye-law 3(a).

Mistry: Bomi Munchershaw (Final), Maneck-Abad, 26–F, Nepean Sea Road, Bombay 6, India. Prof. S. S. Reuben, S. H. Parelkar, H. N. Dallas.

Pathare: Prabhakar Mukund (Final), Reader in Architecture, Faculty of Technology and Engineering, M.S. University, Baroda (Western Rly.), India. S. H. Parelkar, H. N. Dallas, G. B. Mhatre.

Powale: Dattatraya Shantaram (Special Final), Savoy Chambers, West Wing, 2nd Floor, Wallace Street, Fort, Bombay 1, India. S. H. Parelkar, H. N. Dallas, A. S. Patil.

Pradhan: Sharad Bhaskar (Final), 139 'Sanmitra Sadan', Shivaji Park, Road No. 5, Bombay 16, India. P. A. d'Avoine, Prof. S. S. Reuben, S. H. Parelkar.

Shilpi: Bipihchandra Jagannath (Final), Jodhali Baug Road, Panchpakhdi Thana, Bombay, India. Prof. S. S. Reuben, S. H. Parelkar, H. N. Dallas.

Tharthare: Vinayak Keshrinath (Final), Flat No. 22–A, Arsiwalla Mansion, 61 Wode House Road, Colaba, Bombay, India. S. H. Parelkar, A. S. Patil, H. N. Dallas.

Warerkar: Manohar Ramchandra (Final), E5/33 Medical Enclave, Safdarjung, New Delhi 3, India. J. R. Talpade, J. P. J. Bilimoria, R. L. Gehlote.

Obituaries

William James Donger, F.R.I.C.S. [*F*], died on 14 July 1957, aged 69.

Mr. Donger trained with the late J. Ashton Sawyer, F.R.I.C.S. In 1909 he became a partner in the firm of Pink and Arnold, Winchester.

Among his principal architectural works were new offices and showrooms at Winchester for the Southern Counties Agricultural Trading Society, Ltd., reconstruction work at Broadlands, Romsey, and the Hunter tent and boathouse for Winchester College.

Mr. Donger, who had specialised in church restoration and repair work, had been Diocesan Surveyor for the Diocese of Winchester (North Hants Area), architect to Romsey Abbey and to St. Cross Hospital, Winchester.

Hugh Gault [*L*] died on 13 February 1956, aged 56.

Mr. Gault started personal practice in Belfast in 1924. During the Second World War he served in the Royal Engineers in the Middle East and Germany, attaining the rank of Major. Although he returned from the war a sick man, he continued in practice until his death.

His work included housing, shops and motor works, and show houses for the Ideal Home Exhibition at Belfast. He was also an architectural representative for the Borough Building Society in Northern Ireland.

Bertram Hugh Parkin Haigh [*F*] died on 2 April 1957, aged 84.

Mr. Haigh received his technical education at the Regent Street Polytechnic, London, and was articled to Mr. James T. Lee. He began private practice in 1895 in London, opening another office in Chorley Wood, Herts, in 1907. He was responsible for several small country houses in Hertfordshire and London banks, including Barclays in the Edgware Road, and the restoration of some country mansions.

Alfred Ernest Holbrow [*Retd. A*] died on 8 May 1957, aged 79.

Mr. Holbrow was educated at the Regent Street Polytechnic, and from 1894 to 1929 was Senior Assistant to the School of Architecture there. In 1929 he was appointed Head of the Polytechnic's School of Crafts and he held this position until his retirement in 1944. Mr. Holbrow was the author of *Geometrical Drawing*, the first edition of which was published in 1921.

Gordon Arthur Joslin [*Retd. L*] died on 11 June 1957, aged 66.

Mr. Joslin was articled to Mr. A. T. W. Woods of Brentwood, Essex, and started practice in the same town in 1922. His work was mainly domestic within the vicinity of Brentwood.

William Victor Jenkins [*A*] died on 3 September 1957, aged 60.

Mr. Jenkins studied at the Liverpool School of Architecture and started private practice in Liverpool in 1932. In 1939 he relinquished his practice to take up an appointment with Messrs. Costains (then Evans) Medical Supplies. He finally worked for the Liverpool Regional Hospital Board.

His work was general and consisted of houses, factories, church halls, and also included war-time airfield construction.

Sir Geoffrey Granville Whiskard, K.C.B., K.C.M.G., LL.D. (*Hon. A*), died on 19 May 1957, aged 70.

Sir Geoffrey, who was educated at St. Paul's School and Wadham College, Oxford, was the first United Kingdom High Commissioner in Australia. He was appointed in 1936. On his return from Canberra in 1941 he became Permanent Secretary to the Ministry of Works and in 1943 the first Permanent Secretary to the Ministry of Town and Country Planning. He retired in 1946.

Alan Whitehead [*A*] died on 28 May 1957, at the early age of 40.

Mr. Whitehead was educated at Blackpool Grammar School and Oldham High School and the Manchester College of Art. In 1939 he joined the Architect's Department of the Co-operative Wholesale Society in Manchester. During the Second World War he served in the Royal Engineers as a Staff Sergeant with the B.E.F., and later in the desert.

After the war he worked in the Lancashire County Architect's Department and with the M.O.W. in Manchester, until in 1955 he became an Associate Partner of Messrs. Grenfell Baines and Hargreaves [*AA*], in charge of their Manchester office.

Mr. G. Grenfell Baines [*A*] writes:

'Mr. Whitehead was essentially a whole man, imaginative in design and possessing a deep knowledge of building. His personality endeared him to all with whom he worked from juniors to fellow partners. He was greatly respected by clients, builders, and other professional colleagues. His unfailing cheerfulness created optimism and maintained high morale, his enthusiasm was infectious and enlivening.

'Many architects in the north-west have lost a friend, his firm a most promising partner, and the profession, particularly in Manchester, one who bid fair to becoming a valuable, active and loyal member.'

Members' Column

This column is reserved for notices of changes of address, partnerships vacant or wanted, practices for sale or wanted, office accommodation, and personal notices other than of posts wanted as salaried assistants for which the Institute's Employment Register is maintained.

APPOINTMENTS

Mr. Denys Hinton [*A*] has been appointed Deputy Director of the Birmingham School of Architecture. He will continue to practise from 21 The Parade, Leamington Spa.

Mr. Roger K. H. Johnson, A.M.T.P.I. [*A*], has taken up his appointment as Head of the Department of Architecture, University of Rangoon, Burma.

Mr. Kenneth Kiersey [*A*] has joined the firm of Mr. R. W. Humphrey, 1533 Mackay Street, Montreal, P.Q., Canada.

Mr. Merlyn C. Williams, A.M.T.P.I. [*A*], has been appointed Federal Architect/Planner to the Government of the proposed Federation of the West Indies and has therefore dissolved his partnership with Messrs. Thomas and Morgan and Partners [*A/A*].

PRACTICES AND PARTNERSHIPS

Mr. Kenneth Anns, M.C. [*F*], has taken **Mr. D. T. Hunneyball** [*A*], who has been his chief assistant for many years, into partnership. The address and telephone number remain 1 Lincoln's Inn Fields, London, W.C.2 (Holborn 3031).

Patricia Brock [*A*] (Mrs. P. L. Brock) has begun practice at 30 Graham Road, Malvern, Worcs. (Malvern 1127).

Mr. Clifford Culpin [*F*] has taken as associates, with effect from 6 April 1957, **Mr. Roland Robertson** [*A*], **Mr. Leonard F. Hobart** [*A*], **Mr. Anthony Sargeant** [*A*], and **Mr. Philip Vallis** [*A*]. The practice will continue under Mr. Culpin's name from 39 Doughty Street, London, W.C.1.

Mr. Bernard M. Feilden [*A*] has taken **Mr. David Mawson** [*A*] into partnership. The practice will be continued from 71A The Close, Norwich, as **Feilden and Mawson.**

Mrs. Elizabeth A. Fitzgerald [*A*] has begun private practice on Kibagare Estate, P.O. Box 2206, Kabete, Nairobi, Kenya, East Africa (Kabete 349), where she will be pleased to receive trade literature.

Mr. Osric Hawke [*A*] and **Mr. Albert Pereira** [*A*] have formed a partnership under the style of **Hawke and Pereira** at 312 Century House East, Baker Avenue, P.O. Box 1578, Salisbury, S. Rhodesia, where they will be pleased to receive trade literature.

Mr. L. Keir Hett [*F*] has retired after 34 years as a partner in the firm of **Searle and Searle.** He will continue in private practice at Culpepers, Ardingly, Sussex. The remaining partners, **Mr. Eric C. Kent** [*A*], **Mr. David O. Searle** [*A*] and **Mr. John C. H. Odam** [*A*], are now practising from 2 South Square, Gray's Inn, London, W.C.1 (Holborn 0864–5).

The partnership between **Mr. E. F. Massey** [*A*], **Mr. C. W. Tompkinson** [*A*], **Mr. L. T. Wardle** [*A*] and **Mr. G. L. Greaves** [*A*], under the style of Forshaw, Massey and Greaves, has been dissolved. Mr. Massey is now practising in his own name from 18 Museum Street, Warrington, and Messrs. Tompkinson, Wardle and Greaves are practising from 11 King Street, Newcastle-under-Lyme, and 186 Oxford Road, Manchester 13, under the title of **Forshaw, Greaves and Partners.**

Mr. K. W. Paterson, M.C.D., A.M.T.P.I. [*A*], is now in private practice at 83 Wirral Gardens, Bebington, Cheshire, where he will be pleased to receive trade catalogues.

Mr. R. S. Redwood [*F*], **Mr. W. N. M. Miles** [*A*] and **Mr. Gerald Wills** [*A*], formerly of Messrs. Scott and Redwood and Messrs. Miles and Wills, have formed a new partnership under the style of **Redwood, Miles and Wills,** and are practising from 18 Great George Street, Bristol 1.

The practice of **Mr. C. H. Rose** [*F*] at 61 High Street, Leatherhead, has been taken over by **Mr. F. St. G. Higginson** [*A*], who will practise at the same address under the style of **Rose and Higginson.**

Mr. Ronald H. Sims [*A*] and **Mr. Patrick Coles** [*A*] have dissolved the practice formerly styled **Frederic Lawrence and Partners.** Mr. Sims will continue to practise from the present address at 93 Southbourne Road, Bournemouth (Southbourne 47986), whilst Mr. Coles has commenced practice on his own account at Westwood, 23A Victoria Avenue, Winton, Bournemouth (Winton 6591).

Messrs. Lewis Solomon, Son and Joseph have changed their title to **Lewis Solomon, Kaye and Partners (Sidney Kaye** [*F*], **Eric H. Firmin** [*F*], **K. F. Richardson** [*A*] and **E. H. Tietjen** [*A*]) and their address is now Thavies Inn House, Holborn Circus, London, E.C.1 (City 8811).

Mr. Duncan Thomson [*L*] has taken over the practice of the late **J. Stewart Thomson** [*F*]. The practice will now be under the style of **Duncan Thomson** and will be carried out from 49 Hill Road, Wimbledon, London, S.W.19 (Wimbledon 3437 and 0194).

Mr. S. S. Williamson [*A*] has retired from the firm of **Messrs. Lambert and Oliver,** owing to ill health. The practice will be continued by the remaining partners, **Mr. E. P. Lambert** [*L*] and **Mr. W. N. Oliver** [*L*], under the same name and at the same address.

CHANGES OF ADDRESS

Messrs. Borley and Partners [*A*] have changed their address to 3 Clinton Place, Seaford (Seaford 2564).

Mr. P. W. Boucher [*A*] has changed his address to The Malt House, Mill Street, North Petherton, Somerset.

Mr. R. H. Browning [*A*] has changed his address to 110 Park Street, Mayfair, London, W.1 (Mayfair 1145).

Mr. L. Cordwell-Smith [*A*] has changed his address to 20 Worsley Road, Hampstead, London, N.W.3.

Mr. S. Downing [*L*] has changed his address to 12 Drax Gardens, Widey Court, Crownhill, Plymouth, Devon.

Messrs. Eric Firmin and Partners (E. H. Firmin [*F*], **S. Kaye** [*F*], **J. T. F. McCusker** [*A*], and **K. A. Bridger**) have changed their address to Thavies Inn House, Holborn Circus, London, E.C.1. (City 8811).

Mr. Vernon W. R. Gardner [*A*] has changed his address to 10 Glebe Road, Cheam, Surrey (Vigilant 4436).

Mr. Raymond Hardy [*A*] has changed his address to 27 Wanstead Place, Wanstead, London, E.11. His telephone number remains Wanstead 9217.

Mr. Walter F. G. Heath [*A*] has changed his address to c/o Federal Department of Public Works, P.O. Box 8081, Causeway, Salisbury, S. Rhodesia.

Mr. D. R. Holloway [*A*] has changed his address to 35 Hayle Road, Maidstone, Kent.

Mr. Donald W. Insall [*A*] of 31 Northumbria Drive, Bristol, is now also practising from 3 Lyall Street, Eaton Square, London, S.W.1 (Sloane 2239), where trade catalogues will be welcomed.

Mr. P. J. Kirkham [*A*] has changed his address to 2 Firle Close, Ore, Hastings, Sussex.

Mr. Alec B. Maskill [*A*], and his wife, **Mrs. Elizabeth Anne Maskill** [*A*], have changed their address to 284 Ladybrook Lane, Mansfield, Notts.

Mr. Chessor Matthew, A.M.T.P.I. [*A*], has changed his address to the School of Architecture, Belmont, Perth Road, Dundee.

Mr. M. J. Peto [*A*] has changed his address to c/o Messrs. Montgomerie and Oldfield, 50 Bennet House, Jameson Avenue, Salisbury, S. Rhodesia.

Mr. A. W. Snowdon Robertson, A.M.T.P.I. [*A*], has transferred his office to 27x High Street, Maidenhead, Berks. The telephone number remains Maidenhead 477.

The address of **Mr. S. R. Solanki** [*A*] is now: Senior Architect, Heavy Electricals Private Ltd., P.O. Box 46, Bhopal (M.P.), India, where he will be pleased to receive trade catalogues.

Messrs. Arthur Swift and Partners [*A*] have opened a branch office at 10 Melville Street, Edinburgh 3, where they will be pleased to receive trade catalogues, etc.

Mr. G. T. Trinder [*A*] has changed his address to 5 Knighton Road, Otford, Sevenoaks, Kent.

Mr. H. H. Wastell [*A*] has changed his address to c/o Public Works Department, P.O. Box 136, Accra, Ghana, W. Africa.

Mr. John Weate [*A*] has changed his address to c/o British Standards Institution, Modular Co-ordination Studies, 2 Park Street, London, W.1, where he will be pleased to receive catalogues complying with B.S. 1311.

Mr. John B. Wimbs [*A*] has changed his address to 4 High Park Boulevard, Toronto, Ontario, Canada (Lennox 3–4430).

PRACTICES AND PARTNERSHIPS WANTED AND AVAILABLE

Architect, with small but interesting practice in attractive country town in southern England, would consider partnership with another who has some experience of, and interest in, the repair of historic buildings, and who is not entirely absorbed in contemporary work. Public school background essential—Wykehamist preferred. Box 1, c/o Secretary, R.I.B.A.

Associate (32), educated at Sherborne and A.A., with five years' general experience in London practice in charge of handling projects, is now looking for responsible post in established provincial practice with view to partnership. South or south-west England preferred. Capital available. Box 2, c/o Secretary, R.I.B.A.

Associate (37) wishes to dispose of well-established private practice in east Midlands area. Ten years' office lease at very low rental with all office furniture, equipment, stationery available. Small staff also available. Box 3, c/o Secretary, R.I.B.A.

Member (44), with wide experience at home and overseas, seeks appointment in country practice leading to early partnership. Some capital available. Box 4, c/o Secretary, R.I.B.A.

Associate, M.A.(Cantab.), Dipl.Arch. (Oxford), with five years' varied experience in private practice as chief assistant, is looking for a partnership in an established practice with contemporary outlook. Good sailing district preferable. Capital available. Box 5, c/o Secretary, R.I.B.A.

Associate (35), returning to England after running own practice in Kenya for five years, seeks senior position leading to partnership in an established and progressive firm. Interview could be arranged up to the end of January, as advertiser is at present on holiday in United Kingdom. Capital available if required. Box 8, c/o Secretary, R.I.B.A.

Firm of well-established London architects have vacancy for junior partner in busy varied practice. Must have good professional qualifications and experience in London private practice. Some capital and personal contacts an advantage. Age preferred 30 to 35 years. Full particulars in confidence. Box 9, c/o Secretary, R.I.B.A.

Associate, Dip.Arch. (28), public school, in own practice, seeks partnership with larger firm. Experience in research and development, schools, housing, offices, etc., and in industrial design. Some capital available. Box 10, c/o Secretary, R.I.B.A.

Practice available for little capital in south-west coastal area, established post-war, good connections, church and domestic. Excellent prospects for energetic younger architect, or suit older liking country life. Modern house, suitable for two families, with office, garage and ½-acre garden also available if desired. Box 11, c/o Secretary, R.I.B.A.

Associate with considerable experience and own small practice in north Birmingham desires to contact middle aged/elderly member having similar sized practice who is contemplating retirement with a view to amalgamation. Box 13, c/o Secretary, R.I.B.A.

WANTED AND FOR SALE

For sale. *Rebuilding St. Paul's after the Great Fire of London,* by Jane Lang. Copy as new. 22*s.* 6*d.*, post free. Box 7, c/o Secretary, R.I.B.A.

ACCOMMODATION

Member has office 11 ft. 6 in. square to let, with telephone, furnished or otherwise, close to Victoria Station. Services of secretary shared if desired. Box 6, c/o Secretary, R.I.B.A.

Associate requires small room in architects' office in central London, with secretarial and telephone services. Box 12, c/o Secretary, R.I.B.A.

The Royal Institute of British Architects, as a body, is not responsible for statements made or opinions expressed in the JOURNAL.

MOTOR CAR INSURANCE

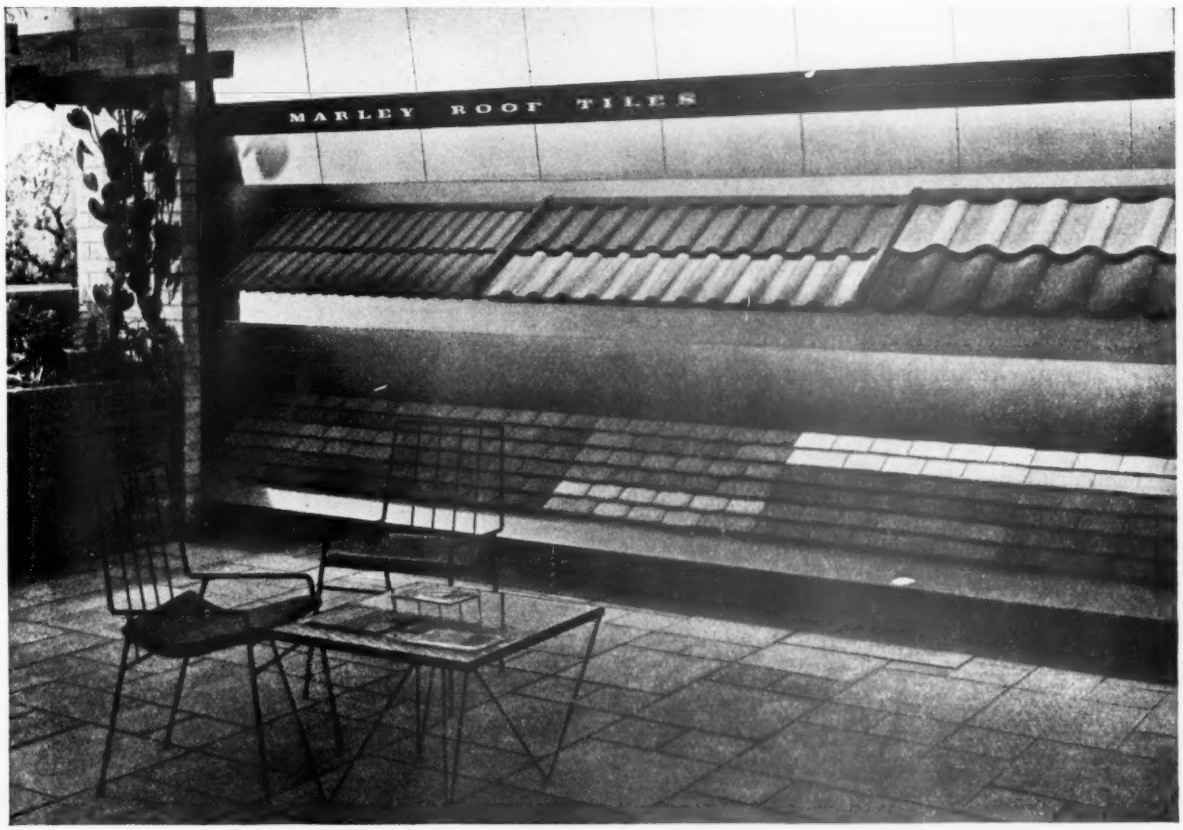
Advantageous terms have been negotiated with Lloyd's Underwriters for Motor Car Insurance through this Agency for Architects and their Assistants. The scope of this cover is wide and includes business use without additional premium. Loss of professional instruments from the car is also covered. The premium rates agreed upon for this scheme show a reduction of 15 per cent on those normally required by the Underwriters. In the circumstances these special terms will not apply to high performance sports cars or to motor-cycles.

Full particulars will be sent on application. May we suggest that you inquire now so that you have details before you when the renewal of your existing insurance falls due? Inquiries to:—

The Manager,
A.B.S. Insurance Agency, Ltd.,
78 Wimpole Street,
London, W.1.
(Telephone: WELbeck 1526)

Eye-level selection . . . AND A CAUTION!

Part of the permanent exhibition at the new Marley showrooms in Tottenham Court Road is devoted to roof tiles. Here, in leisurely comfort (and with experts handy if you should need them) you can make your choice from the widest range of roof tile colours in the world, in the five popular shapes: Plain, Anglia, Yeoman, Ludlow and Westwold. But it is only fair to warn you to allow plenty of time — the ingenious arrangement of the many Marley products holds considerable attraction . . .



All Marley Roof Tiles are covered by the Marley dual guarantee: 1. That Marley Tiles will not laminate or decay for 50 years. 2. When fixed by Marley craftsmen, they will be maintained free for 10 years.

Roof tiles by **MARLEY**

THE MARLEY TILE COMPANY LTD., SEVENOAKS, KENT *Telephone: SEVENOAKS 55255.*
London showrooms: 251 Tottenham Court Road, W.1

Not for an age, but for all time
R.27

THIS WINTER avoid setbacks to drain laying plans by specifying KEY pipes

Key Pitch Fibre drainage pipes can be laid in all weathers. There are no hold-ups for frost, snow or rain because the simple system of jointing requires no cement or other sealing compounds. Precision-machined taper joints are tapped into place giving a perfect fit, so that the drain can be tested immediately on completion and the trench back-filled right away.

Plan now for this winter with Key Pitch Fibre pipes. They ensure that your building schedules do not fall behind while drain laying waits for the 'right' weather.

TGA KD9A

Get to know more about KEY Pitch Fibre Pipes

A PRODUCT OF **KEY ENGINEERING COMPANY LTD**

Smooth bore and clean joints

Key Pitch Fibre pipes have precision-machined taper joints which require no mortar or compounds. Combined with their smooth bore, this means a high flow factor, with no problems of root growth.

No cracking through settlement

The resilience of pitch fibre pipes ensures that no cracking occurs under normal conditions of earth settlement. This also means that bedding concrete is unnecessary.

Resistant to corrosion

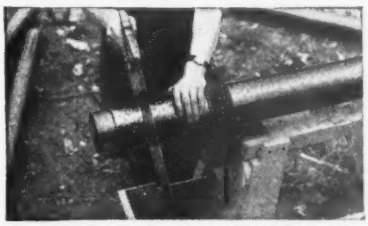
Key pipes are vacuum-impregnated with pitch and are non-porous and resistant to normal effluent corrosives throughout their thickness.

Maximum loan period

The 30-year loan period applies to all Key drain pipes. Pitch fibre pipes have been used with notable success in the United States for over 50 years.

A piece of heavy timber is placed against the coupling and a length knocked home.

The precision-machined taper joints require no mortar or jointing compounds.



Short lengths of pipe can be cut with a coarse toothed handsaw.

A special hand lathe is used for re-tapering joints on short lengths.

SPEEDING THE JOB—CUTTING THE COST

500 feet an hour is a modest rate for laying Key pipes. The simple system of jointing also ensures that the pipe can be laid in all weathers. Because there is no cement to dry out, the completed drain can be tested immediately and the trench back-filled without delay. When contracts must be carried out to a tight schedule these advantages are well worth bearing in mind. On a cost plus labour basis, pitch fibre pipes are cheaper per installed foot run than other drainage systems.

THOROUGHLY TESTED AND APPROVED

British Standard

Key pipes exceed the requirements of BS 2760/56 for Pitch-impregnated Fibre Drain and Sewer Pipes. This standard was approved by the Bituminous Products Industry Standards Committee consisting of representatives of Government departments and professional bodies, including the following:

Royal Institute of British Architects
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Royal Institute of Chartered Surveyors
D.S.I.R.— Building Research Station
Institution of Public Health Engineers
London County Council

Ministry of Health Model Bye Laws

Pitch fibre pipes are deemed to comply with Ministry of Health Bye Law requirements.

Building Research Station Report

Key pipes were tested by this body and given a favourable report.

Other approving bodies

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National Federation of Building Trade Employers.

Royal Society for the Promotion of Health.

Many local authorities have installed KEY pipes

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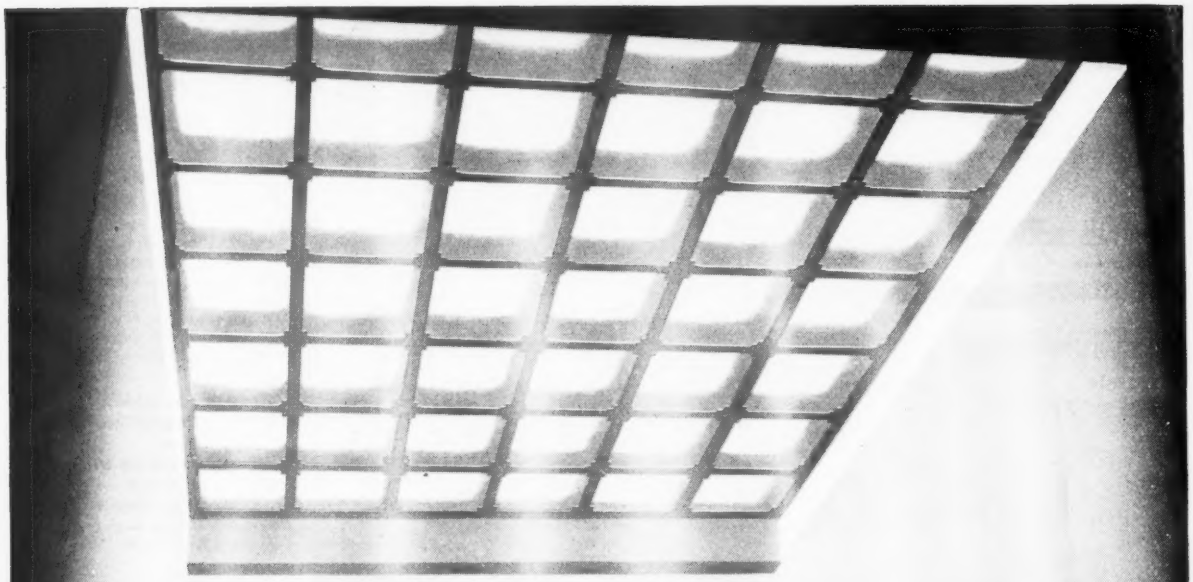
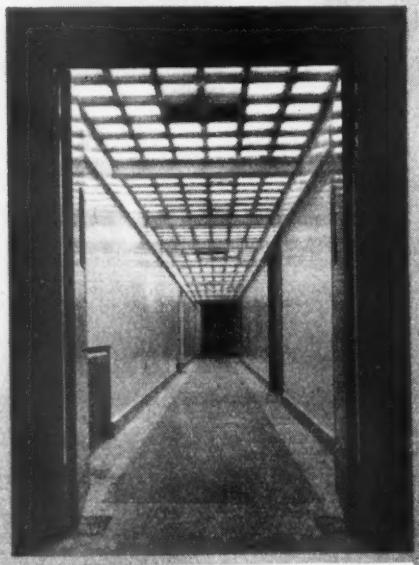


an abundance of daylight



Crete-o-Lux Nine-X double construction roof lights at Limerick Regional Hospital.

.....with an abundance of strength. Purpose made and pre-cast (unless otherwise demanded) these ferro-concrete lights provide rigidity and strength, allied to maximum transmission of light. They are constructed to specified size, for any area.

Photograph by courtesy of Mr. P. J. Sheahan —F.R.I.A.I., M.I.C.E.I. Architect for Limerick Regional Hospital.

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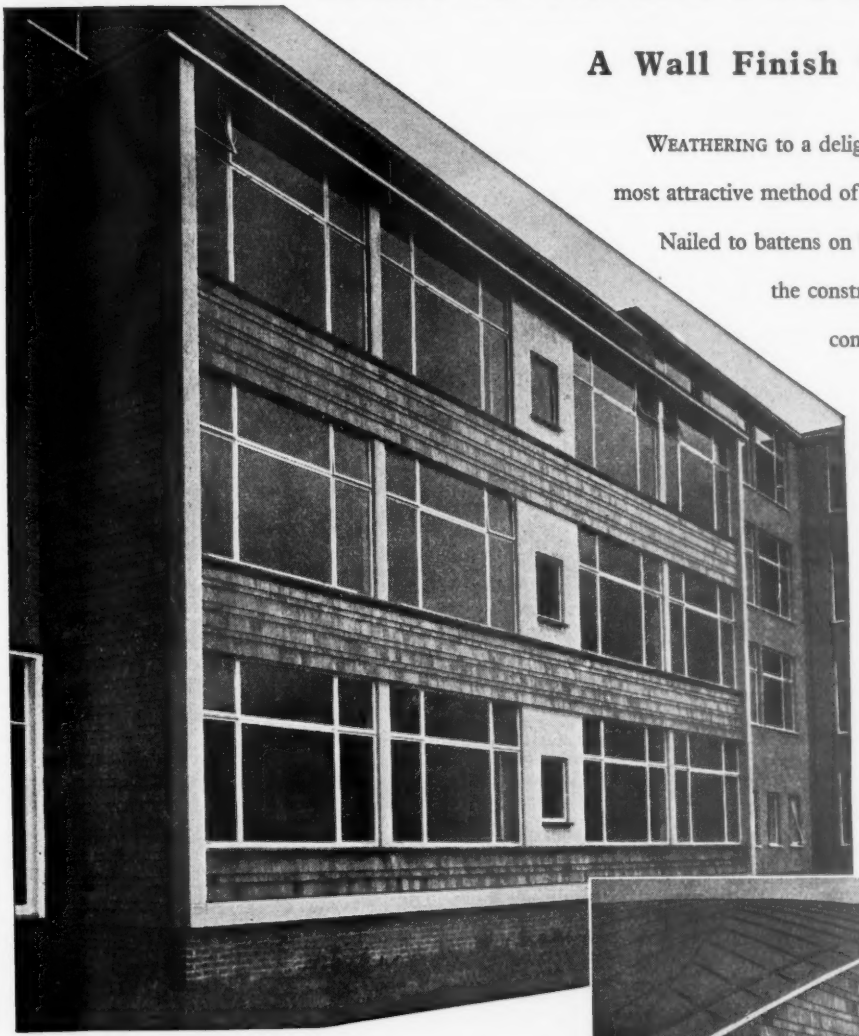

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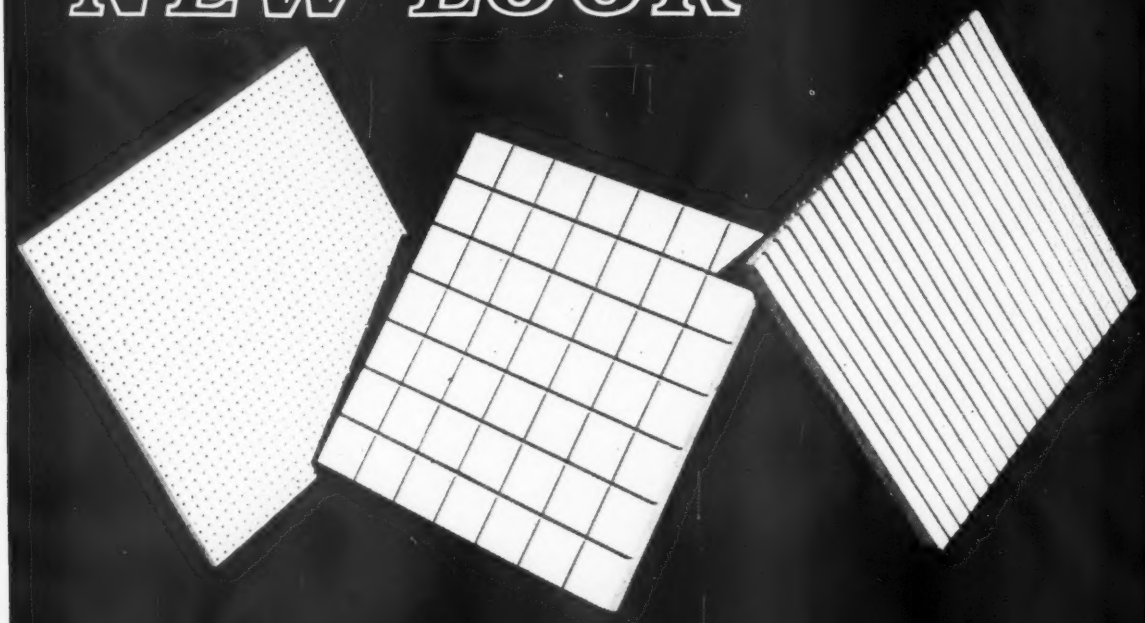

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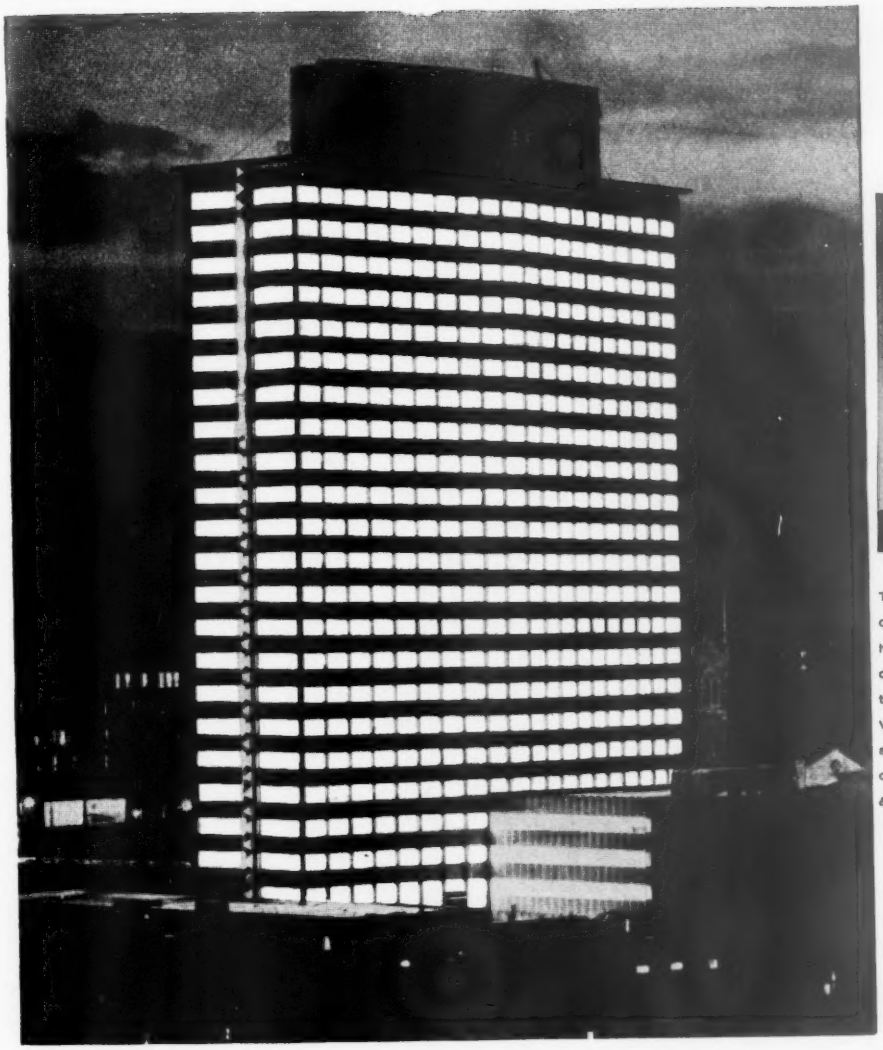

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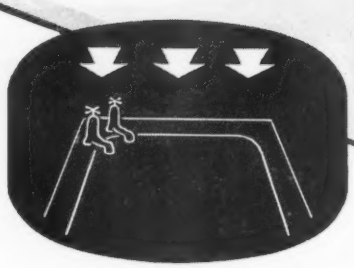

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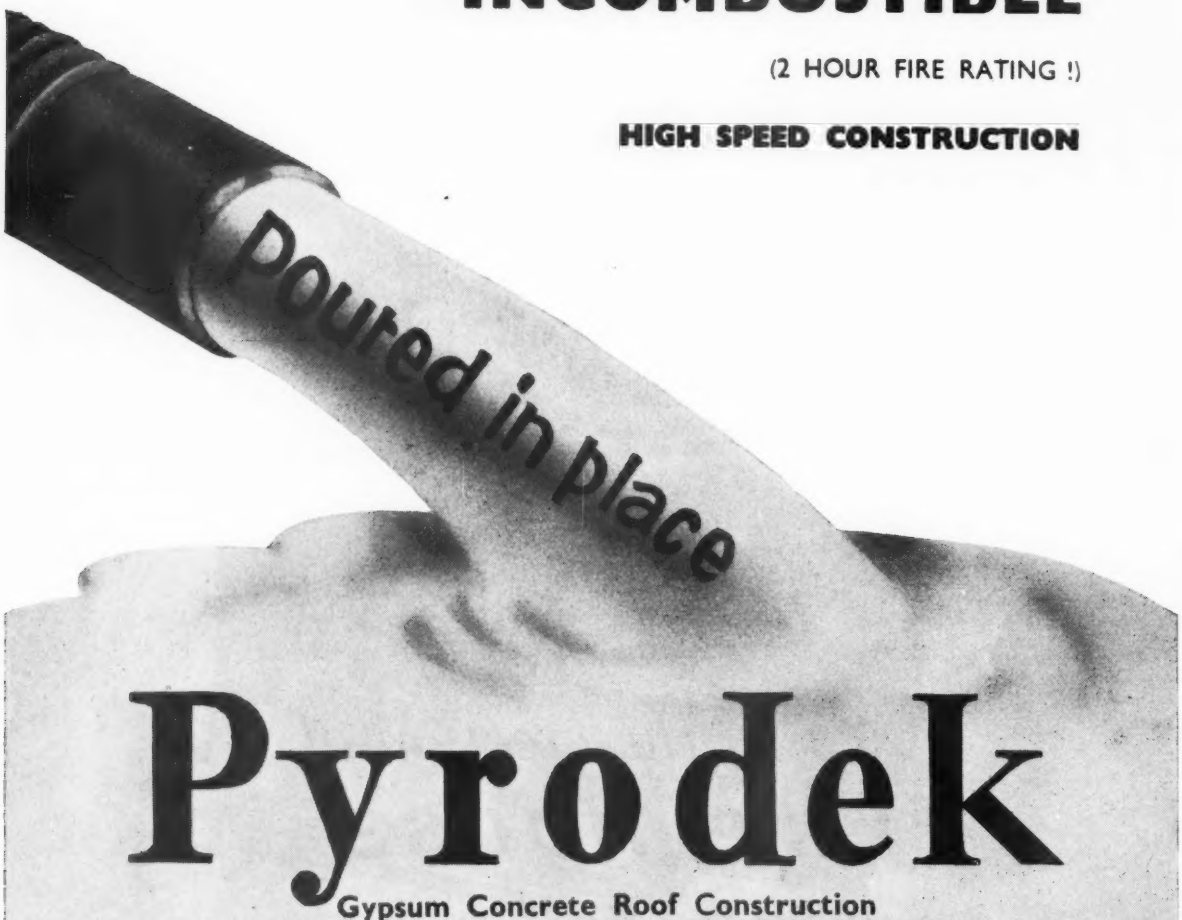

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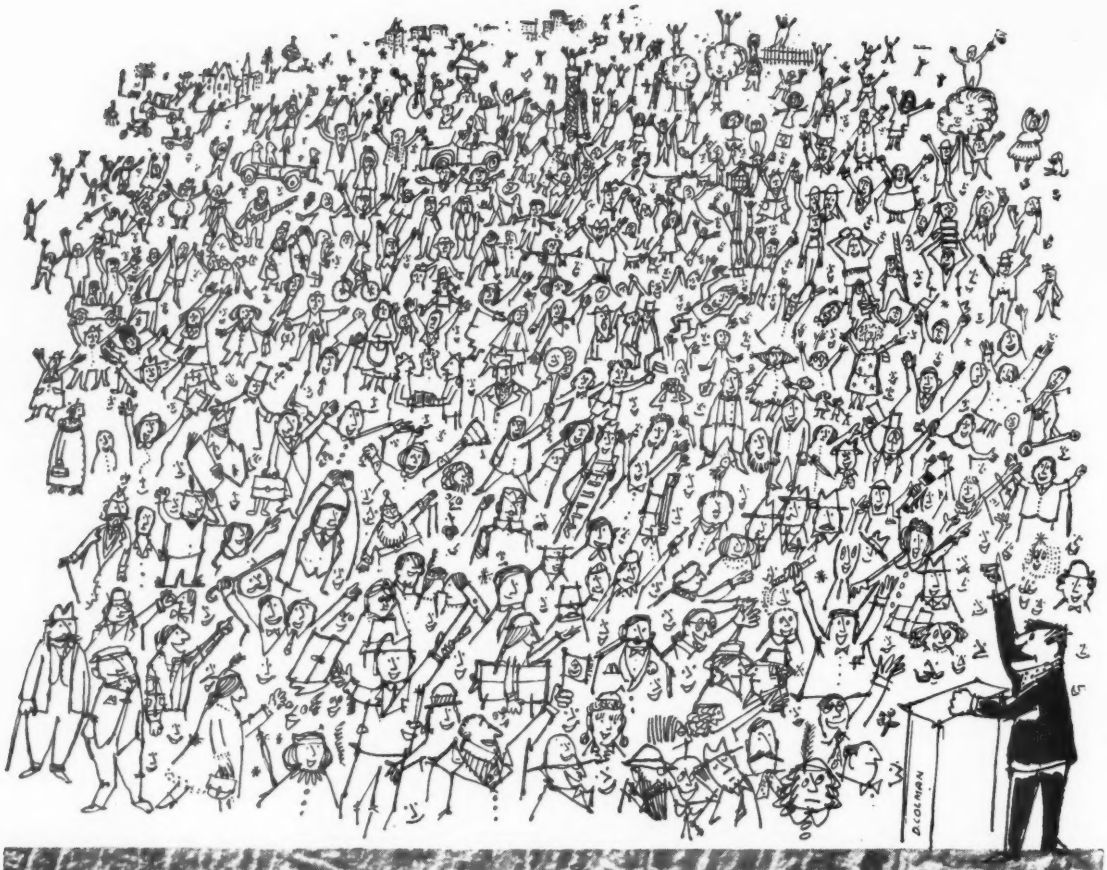

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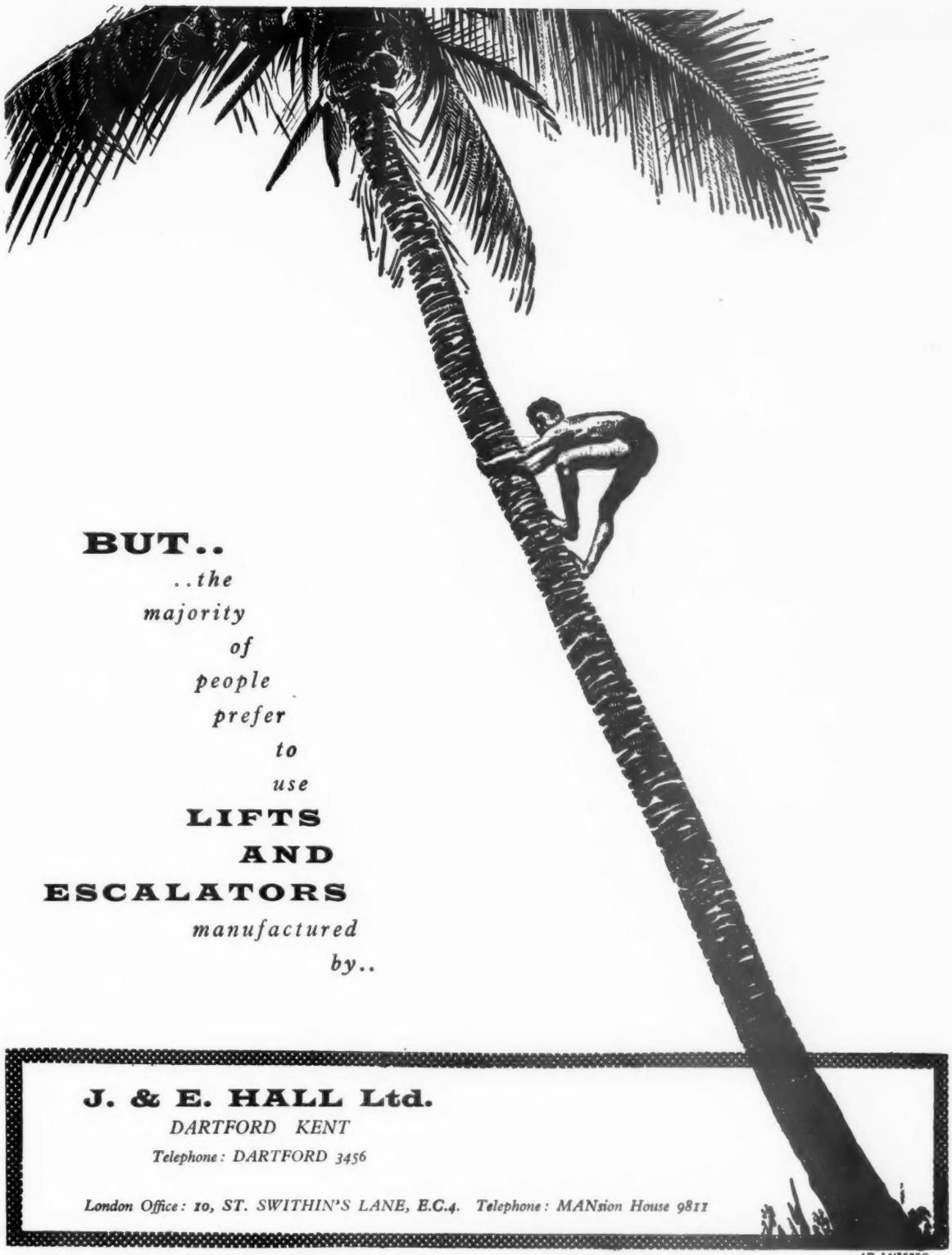

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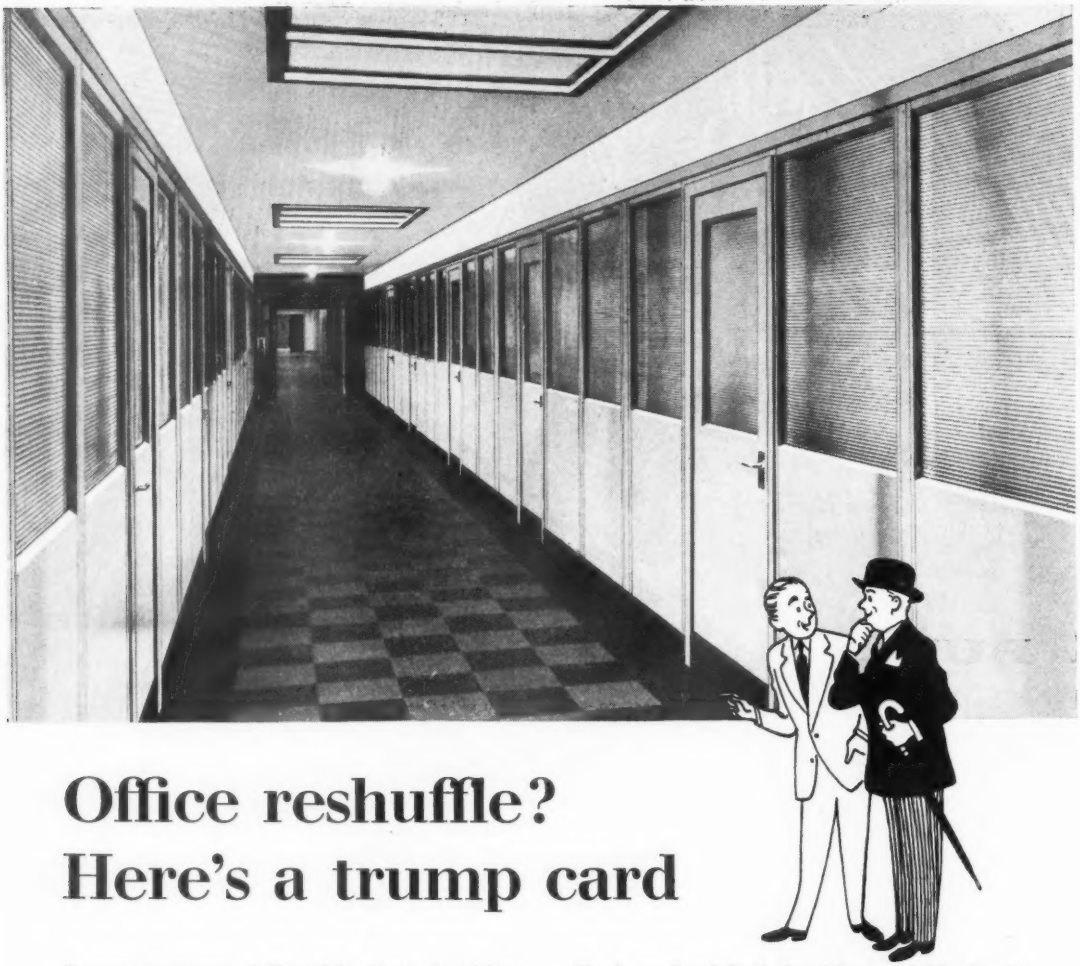

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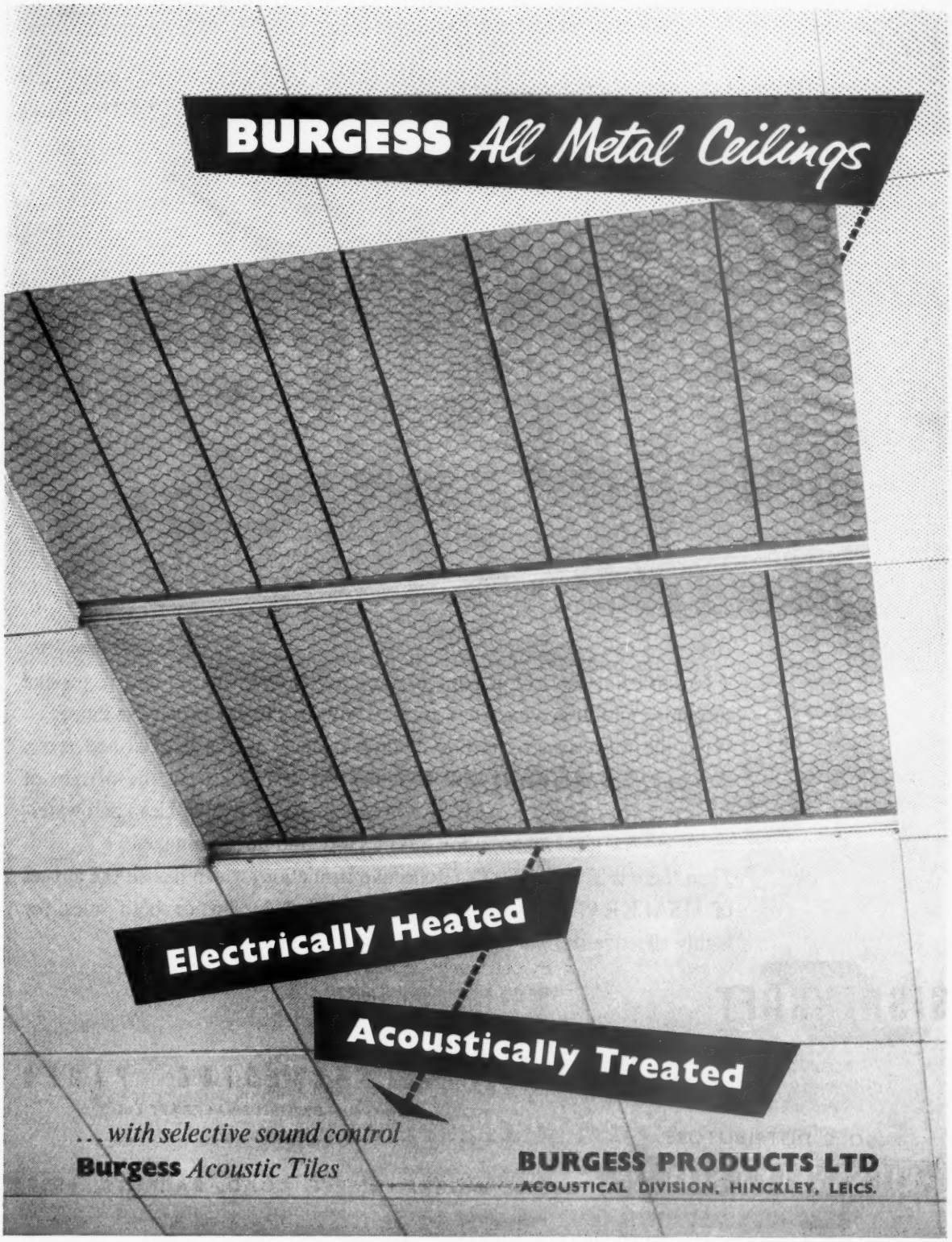
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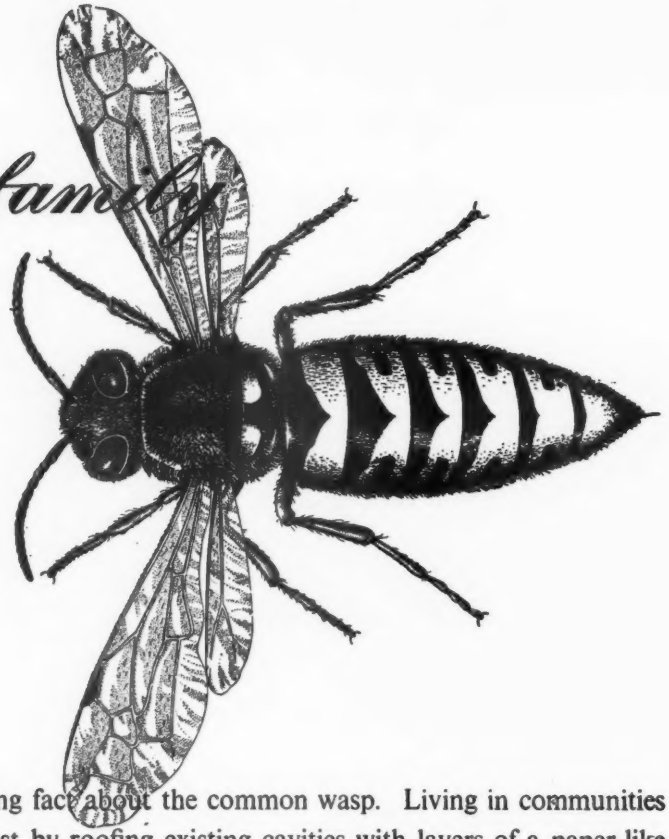

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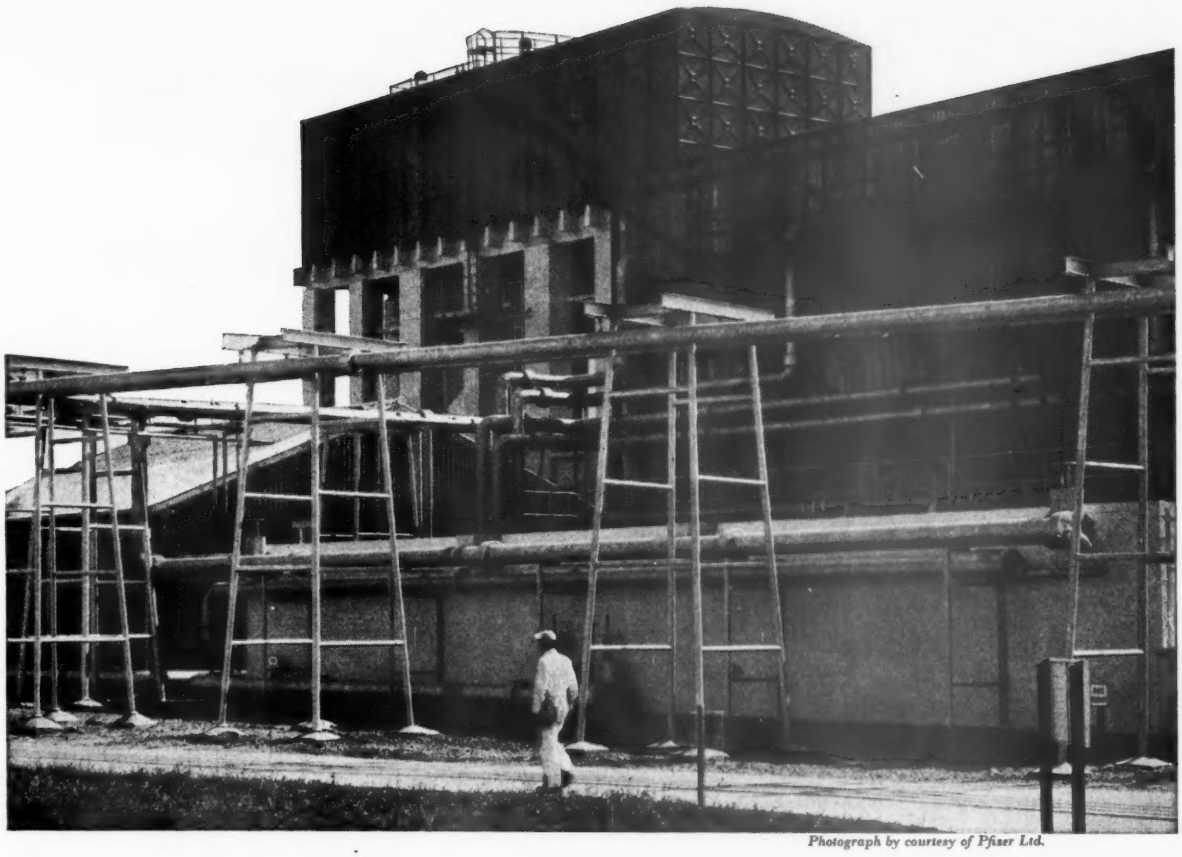

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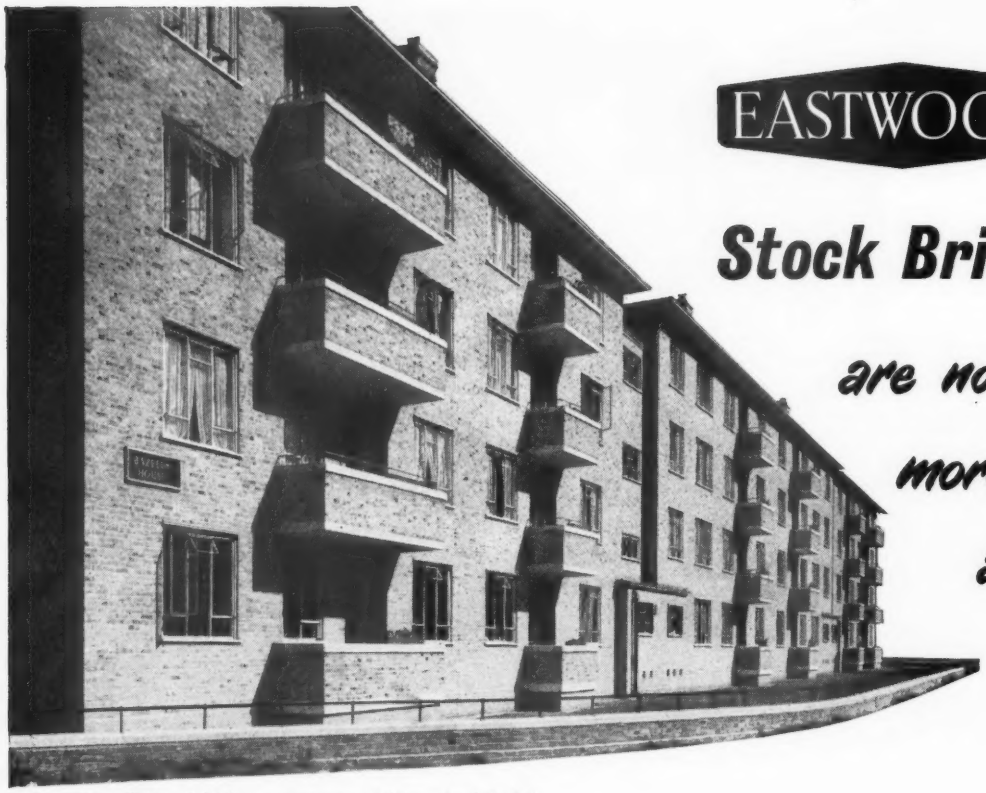

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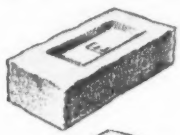

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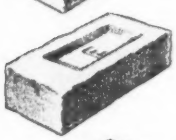

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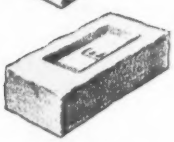

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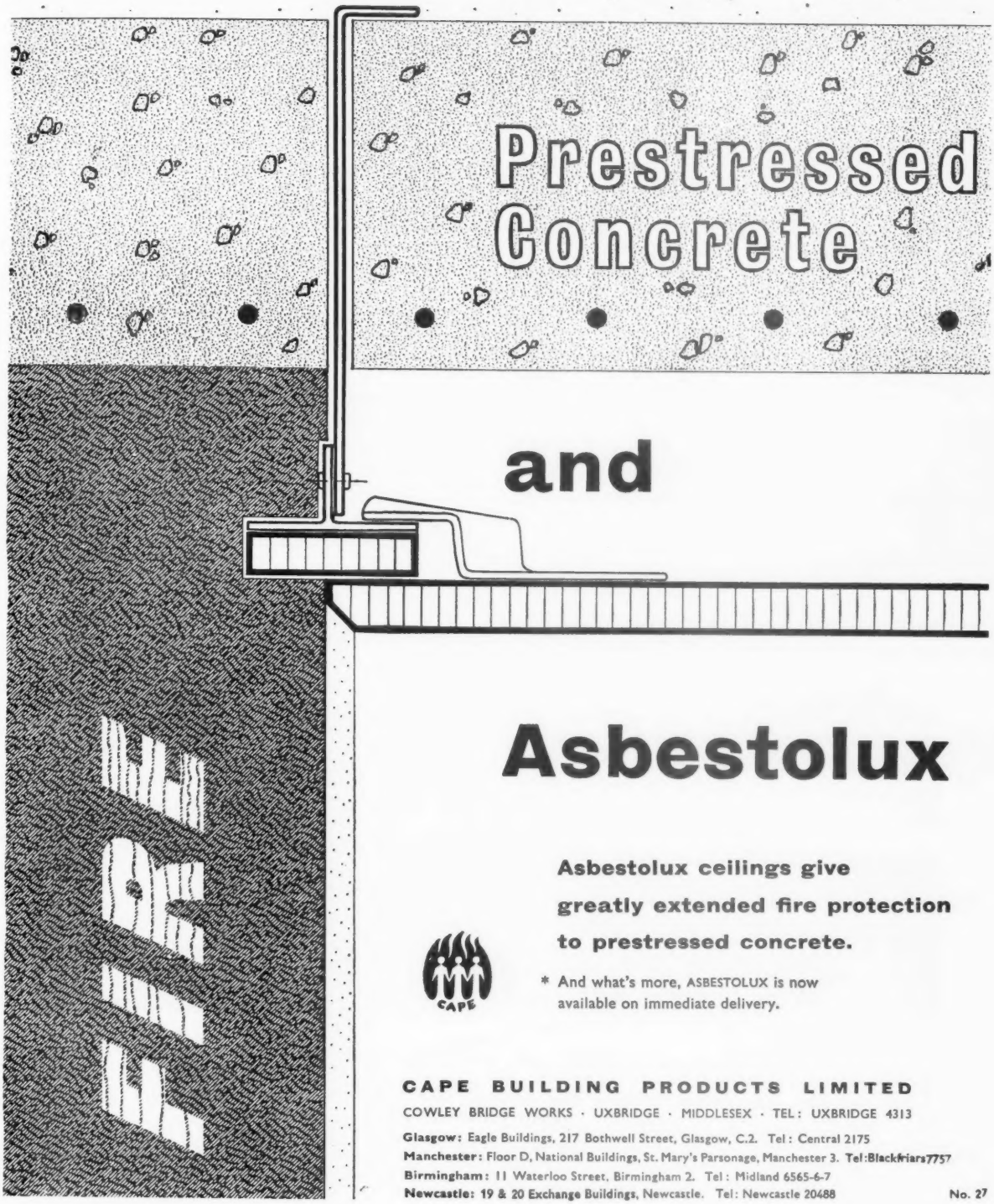

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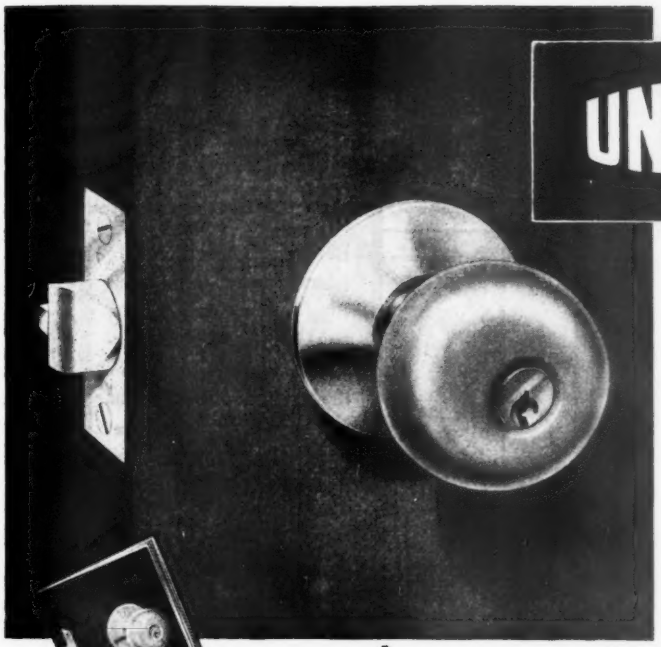

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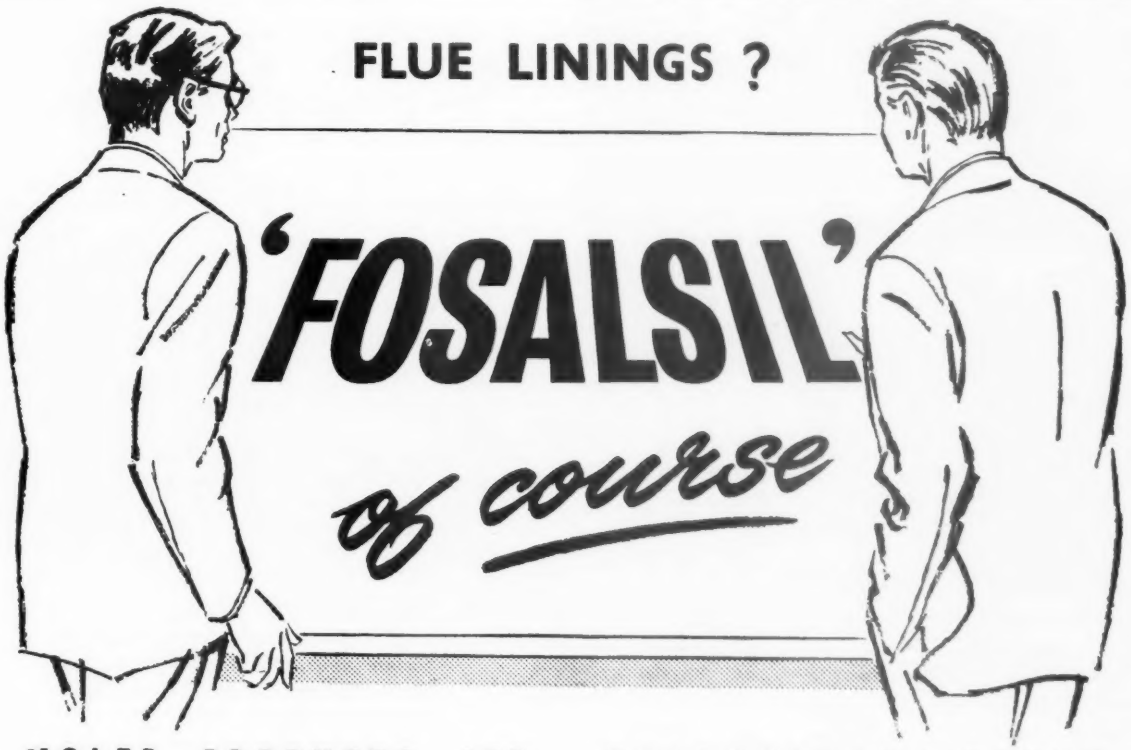

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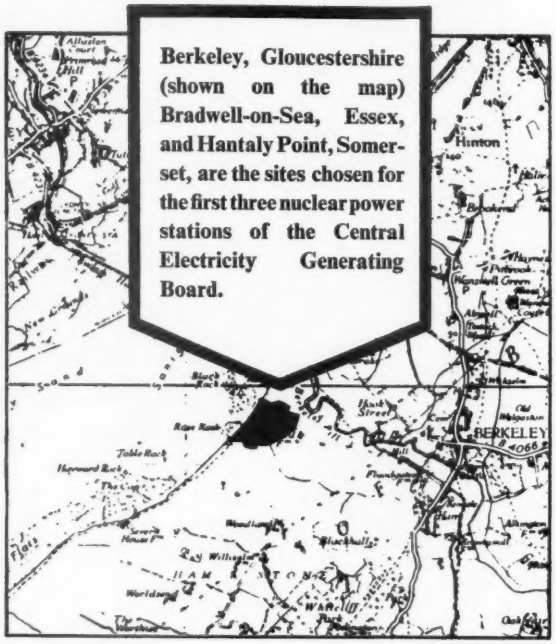

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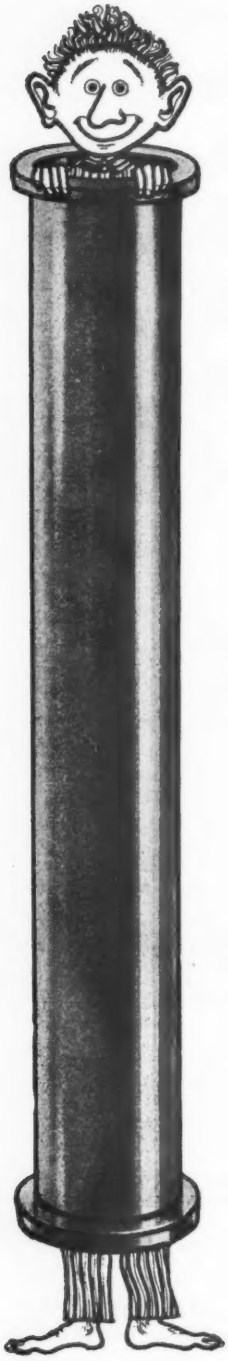

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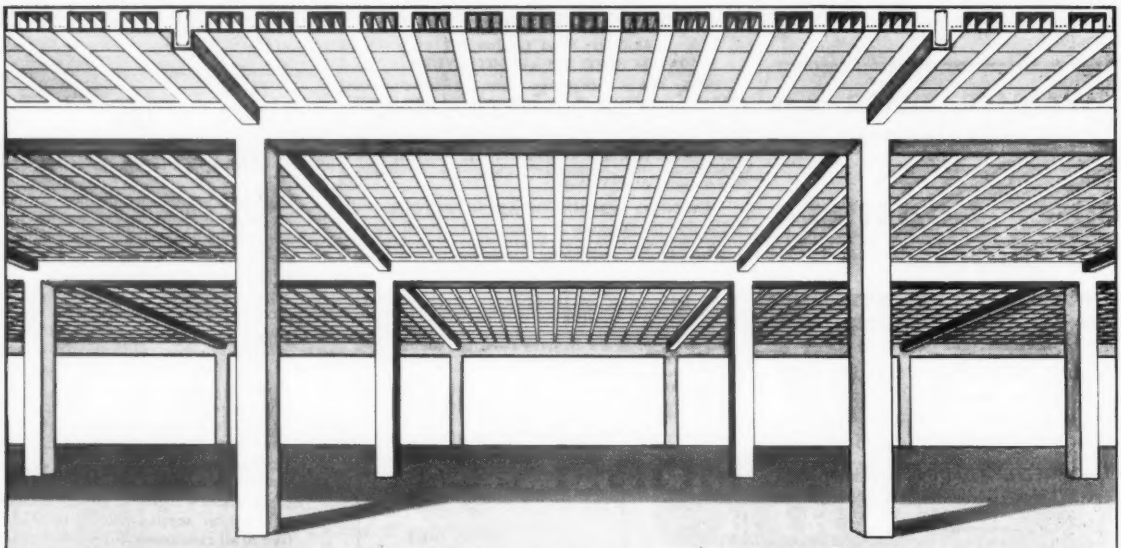

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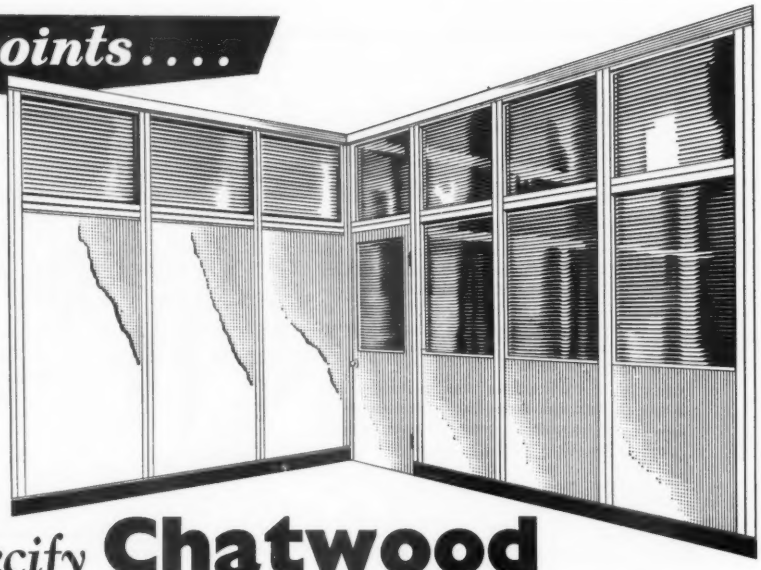

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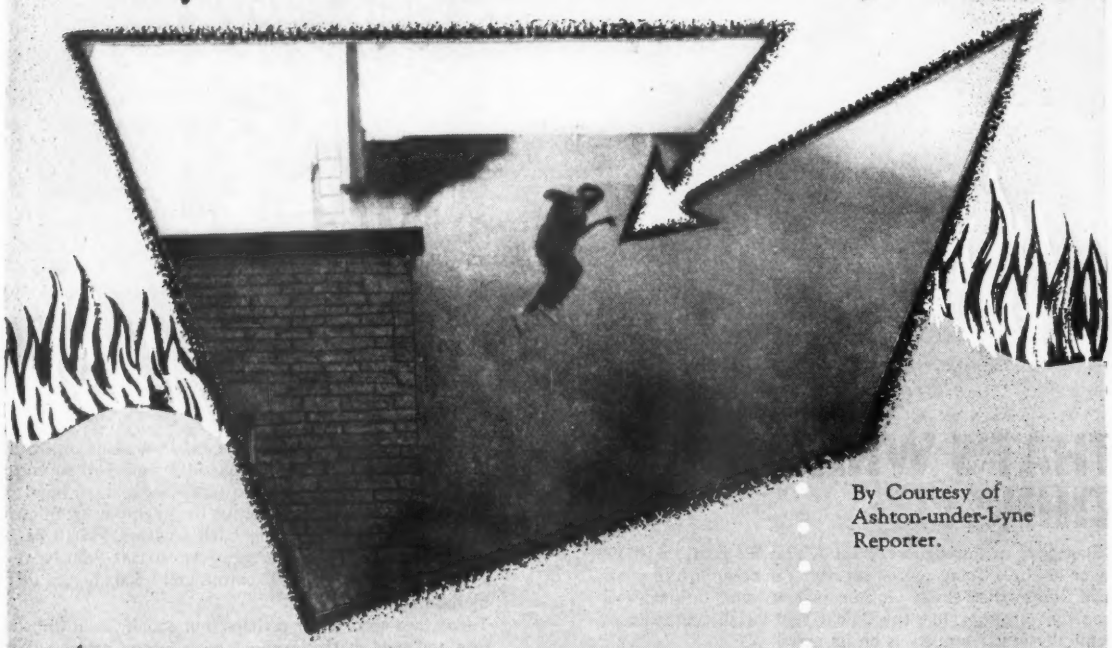

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BUILDING RESEARCH STATION DIGEST 106

January 1958

Fire: Materials and Structures

MODERN standards of fire precautions are based on a broad view of the ultimate objective: to minimize risk to life and property. The behaviour of materials and structures in fire is one factor, the availability of fire brigades, of fire extinguishing and alarm equipment in buildings, etc., are others. This Digest is concerned only with the first: the characteristics of materials and structures that enter in the design of buildings from a fire protection standpoint. These are the combustibility of materials, flame spread on surfaces, and the fire resistance of elements of structure.

Introduction

There is something that will burn in nearly all buildings, and therefore precautions to reduce the danger to the occupants and to protect buildings and their contents are always necessary. Building legislation provides a general minimum standard of protection but the recent large fires in this country and abroad show that heavy losses may still occur. It would be possible to set a standard of structural fire precautions that would, in fact, eliminate any contribution from the building itself to the fire, but the cost would exceed the saving in fire losses.

The standards set out in building regulations take account of a large number of complex questions: not only the behaviour of building materials and structures in fire but also the availability of fire brigades and fire extinguishing equipment in the building, the type of building and the precise objects of the precautions. The designer who wishes in certain circumstances to reduce fire risks still further may be able to do so, often without incurring additional expense, if he appreciates some of the factors affecting the behaviour of materials and structures in fire.

Combustibility

The distinction between combustible and non-combustible materials has already been discussed in Digest No. 72. Here it is necessary to add only that treatment of a combustible material with a flame-retardant paint or solution

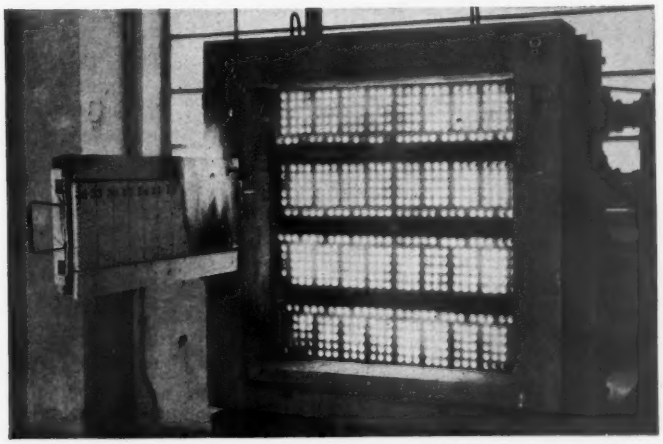

FIG. 1. Test for surface spread of flame. The furnace resembles a large gas-fire in which heat is radiated from incandescent fire-clay elements. The specimen of board under test is held at right-angles to the radiating surface; flame is spreading along it. Boards are classified according to the distance the flame travels before going out

does not make it non-combustible (the function of such treatment will be discussed later).

It is necessary to make such a distinction because a combustible material, however slow-burning, constitutes a risk in any situation where it is exposed continuously to high temperatures, as in a chimney or hearth.

For materials not exposed to high temperature, no such hard and fast classification is needed. Combustible materials vary widely in the ease with which they can be set on fire and the rate at which they burn, properties which vary also according to the thickness of the component and the way in which it is incorporated in the structure. Wallpaper burns readily as a loose sheet, but not when it is stuck to a plastered surface; on the other hand some highly flammable finishes of only paint thickness will burn rapidly even on non-combustible backings. Moreover, what can be regarded as a safe use of a combustible material in one type of building would not be safe in another.

Tests aimed at classifying combustible materials according to their behaviour when set on fire are designed to take account of these conditions; thus the British Standard test* for rate of surface spread of flame (Fig. 1) classifies materials for wall and ceiling finishes according to the tendency of their surfaces to propagate flame. The Joint Fire Research Organization is at present investigating the hazard presented by combustible materials when used in various ways. Meanwhile, the following notes summarize what is generally considered to be safe practice.

Flooring

Timber, rubber, linoleum and plastics may spread flame but do not present any serious hazard when used as flooring.

Wall and ceiling linings

Combustible wall and ceiling boards expose large areas of surface that may provide ready means of spread of fire. The British Standard test for surface spread of flame enables materials to be classified into four groups according to the rate of spread of flame over their surface, those falling within Class 1 having the least rate of spread and those in Class 4 having the greatest. Table 1 gives the classification for various building boards. At present the only comprehensive recommendations for the use of boards of differing flame spread characteristics are those for school buildings, given in Ministry of Education Building Bulletin No. 7, "Fire and the Design of Schools." In general it may be said that boards in Class 4 should not be exposed on walls or ceilings; boards in this class can be ignited by a small flame and produce a self-propagating fire. Those of Class 3 may be used with discretion; for instance timber panelling, which falls into this class, should not be used in corridors or rooms that form part of an escape route. Materials having surfaces attaining Class 1 may be used in most circumstances but sometimes it is necessary to distinguish between those that owe this classification to a surface coating and those that do not.

Effect of surface treatment

The flame-spread classification of the surface of a material may be altered by application of a paint or fire-retardant solution or other thin

TABLE 1

Spread-of-flame classification of combustible wall and ceiling linings

Plasterboard Woodwool slabs Metal-faced plywood Asbestos-paper-faced fibre insulation board	Class 1
Synthetic-resin-bonded paper and fabric sheets Compressed-straw slabs (uncovered)	Class 2
Timber weighing more than 25 lb/cu. ft Plywood weighing more than 25 lb/cu. ft Wood-particle board Hardboard Compressed-straw slabs (paper-covered) Glass-reinforced polyester-resin sheets (with fire-retardant additives)	Class 3
Timber weighing less than 25 lb/cu. ft Plywood weighing less than 25 lb/cu. ft Fibre insulation board Acrylic sheets (polymethyl methacrylate) Glass-reinforced polyester-resin sheets (without fire-retardant additives)	Class 4

* The British Standard references in this Digest all relate to B.S. 476, 1953, Part 1, 'Fire Tests on Building Materials and Structures.'

TABLE 2

Performance of boards tested in fully-lined rooms

Particulars of wall and ceiling linings	*Classification on spread of flame test of B.S. 476*	*Mean time for all room to become involved in fire*	
		min	sec
Non-combustible		17	10
Fibre insulating board with $\frac{3}{16}$-in. skim plaster coat	Class 1	17	45
Woodwool	Class 1	16	45
Plasterboard	Class 1	16	35
Hardboard impregnated with mono-ammonium phosphate (retention of salt stated to be 17 to 18 per cent by weight)	Class 1	15	45
Hardboard with surface treatment of paint A* (30 g/sq. ft)	Class 1	13	30
Fibre insulating board with surface treatment of paint A (30 g/sq. ft)	Class 1	10	35
Asbestos-paper-faced fibre insulating board	Class 1	10	30
Fibre insulating board with surface treatment of paint A (15 g/sq. ft)	Class 1	9	25
Fibre insulating board impregnated with mono-ammonium phosphate (retention of salt—9 per cent by weight)	Class 1	9	00
Fibre insulating board with surface treatment of silicate paint	Class 2–3 (borderline)	7	45
Fibre insulating board with two coats of distemper	Class 3	6	00
Untreated hardboard	Class 3	6	15
Compressed straw slabs	Class 3	5	45
Untreated fibre insulating board	Class 4	5	00

* An intumescent flame-retardant paint.

coating. Thus certain special types of paint will raise the classification of a fibre insulating board from Class 4 to Class 1. However, many materials whose surfaces achieve a particular classification by means of such treatments may under certain conditions give more assistance to the development of fire than those that have the same classification without treatment. This is clearly shown by the results in Table 2: it should be noted that for the Class 1 boards, the shorter times in the last column are not much greater than those for boards in Class 3.

It may therefore be advisable, in specifying the use of Class 1 linings, to restrict the choice to those that attain Class 1 without surface treatment. Such a limitation is imposed in the Ministry of Education Building Bulletin No. 7, "Fire and the Design of Schools".

Roofing

The primary fire-protection function of a roof is to prevent spread of fire into a building from a fire in adjacent property.

There is a wide range of non-combustible roof coverings for both flat and pitched roofs, all of which provide adequate protection against fire. The most widely used combustible roof coverings include asphalt and roofing felt. Asphalt, because of its high content of inert material, is very difficult to ignite and can be regarded as non-combustible. Roofing felts burn readily, and in assessing whether they can be accepted for roofs in built-up areas, account must be taken of two main factors:

(*a*) whether the rate at which they burn when in position on the roof deck presents a serious hazard and

(*b*) whether, in combination with the deck, they sufficiently retard the penetration of fire into the building.

When felt is laid on a concrete roof slab direct penetration is unlikely even if the felt burns away, but when felt is laid on a combustible deck, such as timber, there will not be sufficient resistance to penetration of fire into the building. Accordingly, it is usual to restrict the combination of roofing felt and combustible deck to buildings that are relatively small and isolated. With asbestos-based roofing felts, however, although the bitumen itself may burn, the blanket of asbestos affords a good protection against penetration of fire, and for this reason byelaws permit the more general use of asbestos-based felts on combustible decks.

While there is plenty of experience of the behaviour of the more common forms of roofing, it may be difficult to decide whether a new system of roofing is acceptable. The Joint Fire Research Organization has developed a test that will enable the characteristics of roofs in respect of their resistance to external fire to be determined, and a British Standard based on this work is in course of preparation.

Translucent and transparent corrugated plastic sheets present certain problems: they are all combustible, but the behaviour of different types varies. The only specific requirements for these materials are to be found in the Model Byelaws issued by the Department of Health for Scotland, which restrict their use as roof lights to certain types of building, and also restrict the amount that may be used on a roof and the situation of the sheets. Development in the formulation of this class of material, since the byelaws were prepared, may permit some relaxation on their use in future.

Another type of roofing consisting partly of combustible material is protected metal sheeting, which has been extensively used on account of its resistance to corrosion. Used in conjunction with roof linings of rapid surface-spread of flame, it creates an undesirable hazard, but the risks are much reduced by using a non-combustible lining or one having a Class 1 surface.

A standard is to be prescribed for the resistance to spread of flame of materials used for thermal insulation in factories, and a list of materials is to be issued in connection with the Thermal Insulation (Industrial Buildings) Act, 1957.

Of other types of combustible roofing, mention may be made of wood shingles and thatch. Although these have been used for many years, the evidence from countries where they have been used in built-up areas indicates a major hazard due to the fact that, once they are set on fire, large numbers of flying brands are formed that are capable of igniting similar roofs at appreciable distances from the burning building. For that reason they are subject to byelaw restriction on the size of the building on which they can be used and its distance from other buildings. Many enquiries are received as to possible methods of flame-proofing thatch and wood shingles, and although there are treatments that reduce the flammability of these materials, it must be noted that most of such treatments are soluble in water and may be leached out of the material over a period of years.

Combustible contents

The foregoing paragraphs are concerned with combustible material in the structure. In most buildings, however, especially in those of framed construction with concrete floors, the greatest amount of combustible material is in the contents.

The amount of combustible contents varies widely, from almost nil in a factory producing and handling non-combustible products to perhaps hundreds of pounds per sq. ft in a warehouse stocked with combustible material.

By analogy with floor loadings commonly used in structural design, the amount of combustible material in a building is called the *fire load*. It can be expressed like floor loads, in lb/sq. ft, but is more precisely defined in terms of heat (B.t.u.) per sq. ft that would be liberated when the contents burn. Like fuels, all combustible materials have a calorific value. That of wood is 8000 B.t.u./lb, that of paper is 7000 B.t.u./lb. Thus an office with 5 lb/sq. ft of combustible furniture and papers would have a fire load of 35,000–40,000 B.t.u./sq. ft.

The significance of fire load is that it provides a basis for assessing fire resistance requirements.

Fire resistance

Byelaws specify the periods of fire resistance that must be attained by various parts of the structure and include schedules of the various forms of construction that attain specified periods. Although these enable a designer to comply with the requirements, an understanding of the basis of fire resistance is helpful in interpreting the requirements and it may often be desirable to provide additional protection.

When the various parts of a building are exposed to fire, the combustible parts burn and the non-combustible parts get hot. In either case, as the fire continues, the parts lose their ability to carry out the function for which they were primarily intended. A column will slowly lose strength and, if the fire continues for long enough, may collapse. A wall intended as a fire stop may become heated throughout its thickness and ignite combustible material on the side opposite to that on which the fire started. It is the object of fire-resistance requirements to ensure that the various parts of the structure continue to perform their functions until the fire burns itself out or is extinguished by the fire brigade.

The fire resistance of an element of structure is measured by means of the test laid down in B.S. 476, 1953, which in this country is carried out at the Fire Research Station at Borehamwood. Full-sized walls, columns and floors are loaded and subjected to standard fire conditions. Figs. 2 and 3 show the furnaces for testing walls and columns respectively; that used for testing floors has already been illustrated in Digest No. 54. The fire resistance of the structure is the time between the start of the test and failure by collapse, by penetration of fire, or by excessive temperature rise. It is important to realize that the term as used here relates to the structural element as a whole and

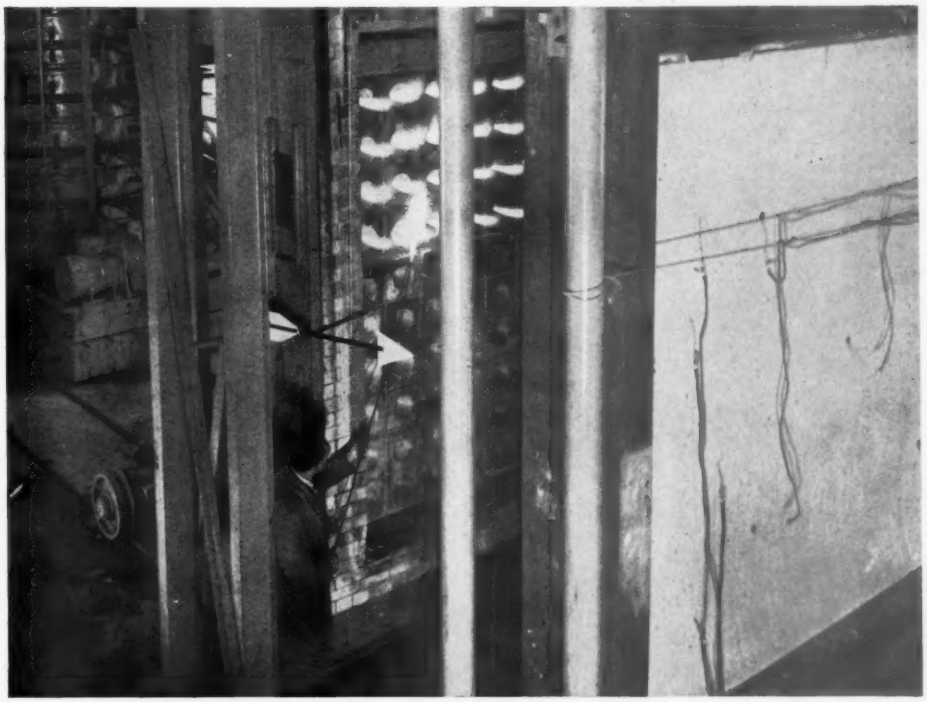

FIG. 2. Fire resistance test on wall. The test wall (under load) is on the right, the furnace on the left. When all the gas jets are alight the furnace is moved, on its carriage, up to the wall

to a precise specification of the element. Thus, although a timber joist floor with plain-edged boards and a wood lath and plaster ceiling has a fire resistance of less than half an hour, this resistance can be increased to as much as 2 hours by changing the ceiling and by incorporating pugging between the joists. What may seem to be minor changes in the detail of the construction can change its fire resistance significantly. For example the fire resistance of a 4½-in. brick wall may be increased from just less than 2 hours to 6 hours by the application of ½-in. gypsum perlite plaster on each side.

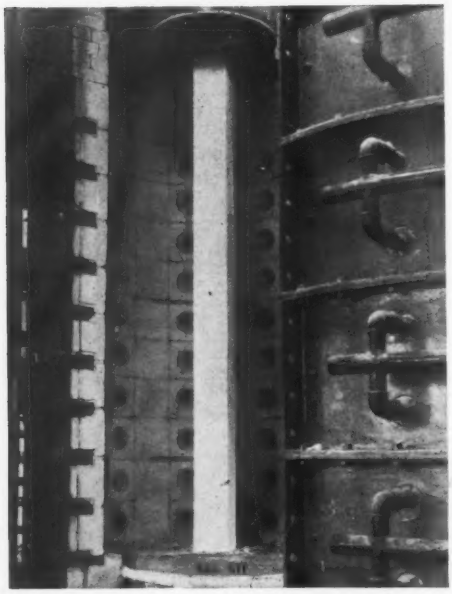

FIG. 3. The column furnace. The furnace is in two semi-cylindrical halves. The half whose outside may be seen on the right is moved into position when the gas jets have been lighted

Fire-resistance requirements

The British Standard test for fire resistance determines the fire resistance under standard fire conditions and by itself gives no guide as to the period required in a particular building. The fire load provides such a guide. The severity of a fire in a building depends largely on its fire load and measurements have been made of the severity of fires caused by different fire loads. These measurements have enabled the severities of fires due to known fire loads to be expressed in terms of periods of exposure to fire by the standard test. For design purposes the equivalences shown in Table 3 have been adopted.

TABLE 3

Assumed equivalent severities of building fires

Fire load B.t.u./sq. ft	*Equivalent severity of fire in hours of standard test*
Less than 100,000 ("low")	1
100,000–200,000 ("moderate")	2
200,000–400,000 ("high")	4

Thus, if a building is to contain a fire load of 150,000 B.t.u./sq. ft, walls, floors and other elements having a fire resistance of 2 hours would be expected to resist the effects of the fire without collapse or penetration of fire even if all the material burned. Such a standard takes no account of the effects of fire-fighting, however, and where there is good expectation of early extinction of a fire it is customary in regulations to allow a lower standard of fire resistance than that related directly to fire load. This lower standard is usually applied to small buildings, the highest standard being retained only for larger buildings where rapid fire extinction may not be possible.

(Prepared at the Building Research Station, Garston, Herts, in collaboration with the Joint Fire Research Organization.)

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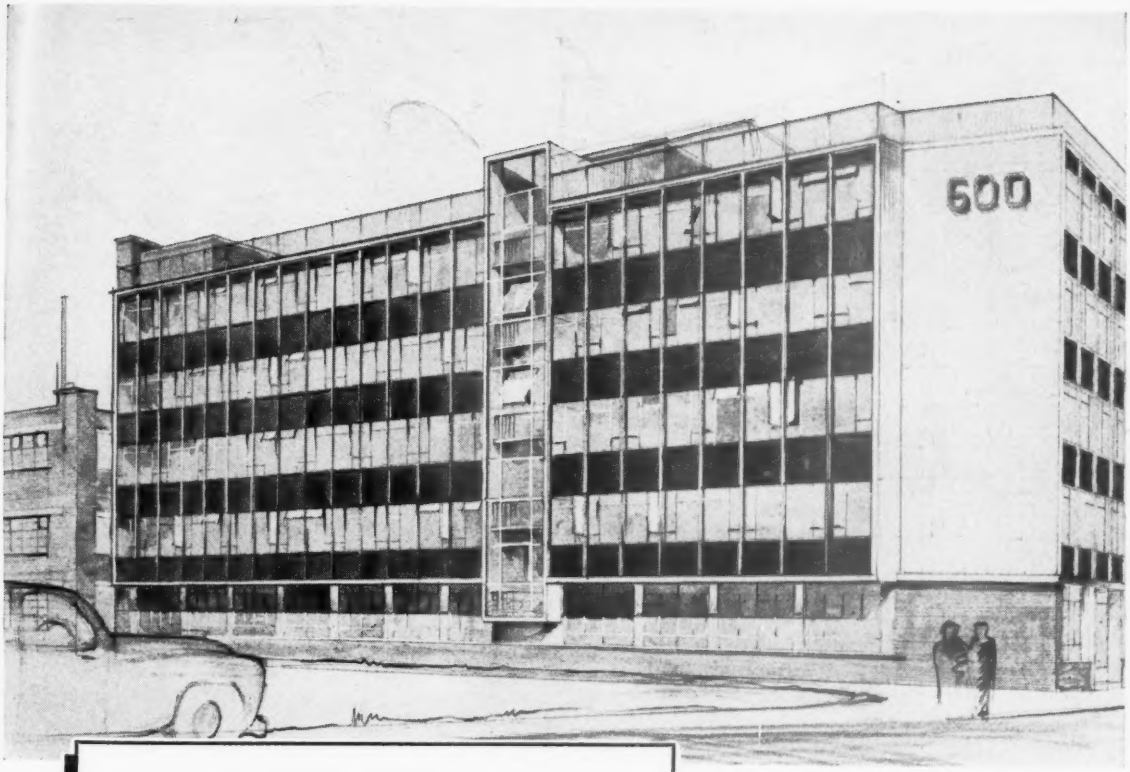

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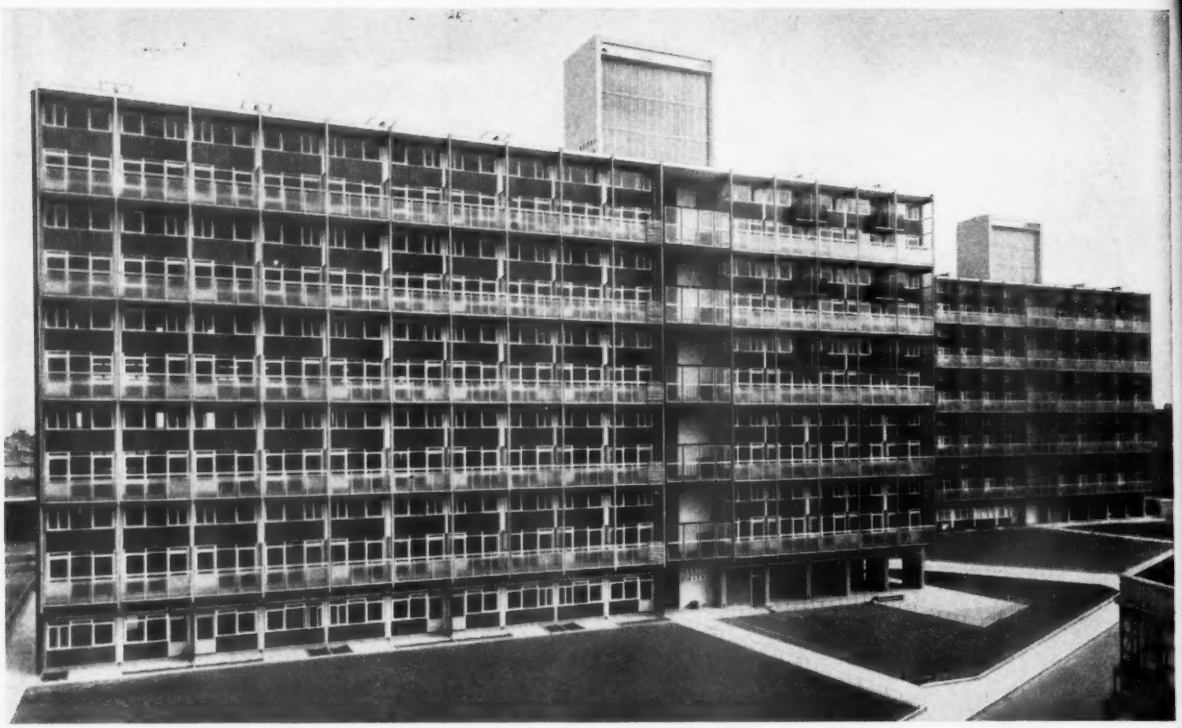

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MULTI-STOREY HOUSING AT PICTON STREET

THE LONDON COUNTY COUNCIL housing re-development scheme at Picton Street, Camberwell, for which John Laing and Son Limited were nominated as contractors at the design stage, consists of nearly 700 houses, flats and maisonettes, including four 11-storey blocks.

The 11-storey blocks are of reinforced concrete crosswall construction, with precast concrete main floors and prefabricated timber units for intermediate floors. External walls are clad in Brunei teak in prefabricated panels and gable ends are faced with precast exposed aggregate panels.

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